Contractor's Report to the Board

Sustainability in the Motion Picture Industry

November 2006

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In addition to Joanna Hankamer, who was involved in this project throughout its duration, and Shannon Clements and Jeannie Olander who have been involved since Spring/Summer 2004, other students have also contributed in various ways: Fatma Cakir, Patricia Greenwood, Penny Naud, Kimberly Pargoff, and Michael Rabinovitch. Linh Goc and Todd Steiner prepared the transcript of the second conference held at UCLA.

Collaborators

Several individuals who were not formally employed as part of this project nevertheless contributed significantly. Professor David Rigby was a key collaborator in estimating the environmental impacts of the motion picture industry. Professor Barbara Boyle, Professor Mary Nichols, and Gigi Johnson generously shared their contacts and insights. Many individuals generously shared their time by agreeing to be interviewed by the team; some are listed in the Appendix, but many others spoke with us under condition of anonymity.

Throughout the project, the UCLA team received exceptional assistance and support from the contract managers at CIWMB (Judith Friedman, Brenda Smyth, and Kristy Chew), for which we are very grateful.

Executive Summary

Background

This report summarizes the findings of the 2-year project on "Motion Picture Industry Sustainability" conducted through the UCLA Institute of the Environment, under contract to the California Integrated Waste Management Board, during Summer 2003 - Spring 2005.

The objectives of the study were to identify existing environmental best practices within the industry, based on interviews and case studies, to develop a "green production guide" based on those practices, and to organize forums for disseminating the findings to the motion picture industry. Throughout, the "motion picture industry" includes film and television production. The focus of the study was exclusively on the production side of the industry, not on distribution or on content.[1]

Structure of Report

This report is structured as follows. It first offers a brief historical view of environmental issues in the motion picture industry, by characterizing how the trade literature in the industry writes about environmental issues. The report then provides a high-level estimate of the environmental impacts of the industry, using input-output life-cycle assessment, and concludes that the sheer size of the industry makes it a significant contributor to conventional air pollution, greenhouse gas emissions, and energy consumption in the Los Angeles area.

The report then provides a more micro-level perspective of the motion picture industry, based on interviews with a wide range of individuals from almost all sides of the industry. The report then provides a series of examples of environmental best practices. The next section of this report summarizes the existing "green production guides." The report then discusses the two conferences that were held during this project. The first conference was a small evening forum on April 14, 2004; the second was a larger full-day conference on February 4, 2005. The report ends with summary conclusions and recommendations, and includes extensive appendices with more detailed information and sources.

A Word of Caution

The reader should bear the following guidelines in mind when interpreting the statements made in this report:

- Much of the information provided here is directly or indirectly quoted from individuals we spoke with during the project. In many instances it was not possible to obtain external corroboration for each statement, so many of the statements contained in this report should be viewed as opinions expressed by individuals within the industry, rather than as proven facts or widely-held opinions. As the objective of the study was more to obtain a richer understanding of how the industry in general deals with environmental issues, this is not a concern for our overall findings, but it does mean that any specific statement must be interpreted with caution.

[1] A separate project conducted in parallel at the Environmental Finance Center for Region IX focuses on environmental behavior in content of film and television. See their website at http://www.greenstart.org/efc9/ for more information.

- A report such as this is doomed to always be a work-in-progress: feedback on any aspect of it is always highly appreciated.[2]

Introduction

Background

This report summarizes the findings of the 2-year project on "Motion Picture Industry Sustainability" conducted through the UCLA Institute of the Environment, under contract to the California Integrated Waste Management Board, during Summer 2003 - Spring 2005.

The objectives of the study were to identify existing environmental best practices within the industry, based on interviews and case studies, to develop a "green production guide" based on those practices, and to organize forums for disseminating the findings to the motion picture industry. Throughout, the "motion picture industry" includes film and television production. The focus of the study was exclusively on the production side of the industry, not on distribution or on content.[3]

CIWMB selected the motion picture industry due to its high visibility: environmental best practices uncovered while studying the motion picture industry are more likely to attract interest from and to be implemented by other industries. In addition, the motion picture industry can be thought of as a model towards which many other industries are converging. For instance, industries such as fashion, toys, technology, aerospace, and pharmaceuticals all increasingly rely on a network of organizations jointly performing research and development, sharing responsibility for production and distribution, and disbanding after a few years when the next generation of products requires an entirely new network. This decentralized structure has been in place in the motion picture industry for many years, so understanding the challenges related to environmental issues in this context, and how the motion picture industry has dealt with these challenges, is instructive for a broader set of industries.

Structure of This Report

This report is structured as follows.

The report first offers a brief historical view of environmental issues in the motion picture industry, focusing on the past decade, by characterizing how the trade literature in the industry writes about environmental issues.

The report then provides a high-level estimate of the environmental impacts of the industry, using input-output life-cycle assessment, and concludes that the sheer size of the industry makes it a significant contributor to conventional air pollution, greenhouse gas emissions, and energy consumption in the Los Angeles area, and even to some degree at the California level.

The report then provides a more micro-level perspective of the motion picture industry, based on interviews with a wide range of individuals from almost all sides of the

[2] Please direct feedback to Charles Corbett, at charles.corbett@anderson.ucla.edu.
[3] A separate project conducted in parallel at the Environmental Finance Center for Region IX focuses on environmental behavior in content of film and television. See their website at http://www.greenstart.org/efc9/ for more information.

industry. The interviews provide a rich insight into the complexity of the industry, the constant tension between creative and financial pressures, the conflict between wanting to do things right but always needing to do things fast, and the apparent paradox between the industry's often admirable efforts to protect resources and locations and the industry's pervasive throwaway mentality.

With this better understanding of the challenges facing anybody endeavoring to promote environmental behavior within the industry, the environmental best practice examples in the next section of this report are all the more impressive. Most of these environmental practices turn out, in fact, to be economically superior too, as they lead to savings in cost or, often more importantly, time.

During the research we uncovered several existing "green production guides," some of which are still actively maintained. The next section of this report summarizes those guidelines, which are very well-intended but which (apart from a few isolated exceptions) do not appear to have had as much impact in practice as they deserve. The report then discusses what conditions need to be met for any green production guide to have more impact on practice.

The report then discusses the two conferences that were held during this project, the first a small evening forum on April 14, 2004, the second a larger full-day conference on February 4, 2005.

The report ends with summary conclusions and recommendations, and includes extensive appendices with more detailed information and sources.

Our Experience During the Study: Challenges Encountered

During the course of the research, we found that the motion picture industry is simultaneously very progressive and very conservative with respect to environmental innovation. Many individuals within the industry are very proactive, well-educated, entrepreneurial environmentalists, and have accomplished many noteworthy improvements. The structure of the industry mitigates against environmental improvement, though: its highly decentralized nature, with its focus on short-term ever-changing production teams rather than long-term physical supply chains, and the contrast between its high popular visibility and financial instability resulting from its complex organizational structure, stand in the way of its adopting many of the environmental programs that are common in more traditional industries.

The public visibility of the industry also seems to contribute to a certain degree of paranoia, in the following sense: within the industry, there is a very strong sense that individuals and entire companies succeed or fail based on highly volatile public perception. The public at large does not think of the motion picture industry as polluting or otherwise environmentally harmful, so any publicity related to environmental initiatives within the industry would, in that view, draw attention to the existence of environmental problems that apparently need solving.

The result of these internal tensions is that, while many individuals have been very generous with their time and have openly shared their experiences with us, often at length, it has proved impossible to get the "official" level of access that would be required for full-scale case studies documenting an entire film or television project, from

beginning to end, highlighting the environmental practices encountered, whether good or bad.[4]

We have circumvented that by combining various other perspectives in this report: the historical (based on an analysis of environmental writing in the industry's trade publications), the macro (estimating the environmental impacts of the industry based on high-level input-output life-cycle assessment data), the micro (based on the extensive interviews we conducted), that of the industry leaders (based on a collection of mini-cases we were able to assemble), that embodied in the guidelines (based on the existing green production guides), and the public (based on the two conferences we organized).

We hope that this report and the best practice examples mentioned here will inspire others within the industry to carefully examine their environmental footprints and find creative ways to further shrink those footprints without making economic sacrifices.

Environmental Issues in the Motion Picture Industry: A Historical View

This chapter provides a historical perspective (focusing on the period 1991-2004) of the prevalence of environmental issues and sustainability in the motion picture industry by analyzing the content of articles within the trade literature aimed at individuals working within the industry.

Methodology

Several publications exist that are aimed at individuals working within the motion picture industry. Among those, the *Hollywood Reporter* and *Variety* are often considered the most important. In order to better understand how the role and prominence of environmental issues has changed over time within the industry, we conducted an informal content analysis of these publications, going back to the early 1990s, using the online archives. We searched for the following terms (including variations of these terms): "Earth Day," "ecology," "EMA" (for Environmental Media Association), "environmental," "global warming," "NRDC" (for Natural Resources Defense Council), "pollution," "recycling," "solid waste," and "sustainable."

We discarded articles in which these terms were used in a non-environmental sense; for instance, "recycling" usually referred to a plot or to characters; i.e., using the same plot or characters in a new show. We only counted articles with a dominantly environmental theme; a full article on a series of motion pictures to be released including a brief mention of one with an environmental-sounding title would not be counted, while an article that focused exclusively on that environmental film would be counted, (a list of articles is provided in Appendix E). Also, multiple articles with largely identical content, either in different publications or appearing at different times in the same publication, would usually be counted as one. (For instance, a report on the nominations for the EMA awards and the report a few weeks later on the EMA awards ceremony would be counted as one.) Finally, there are occasional mentions of environmental impact reports needed for various studio expansion plans; these are not included.

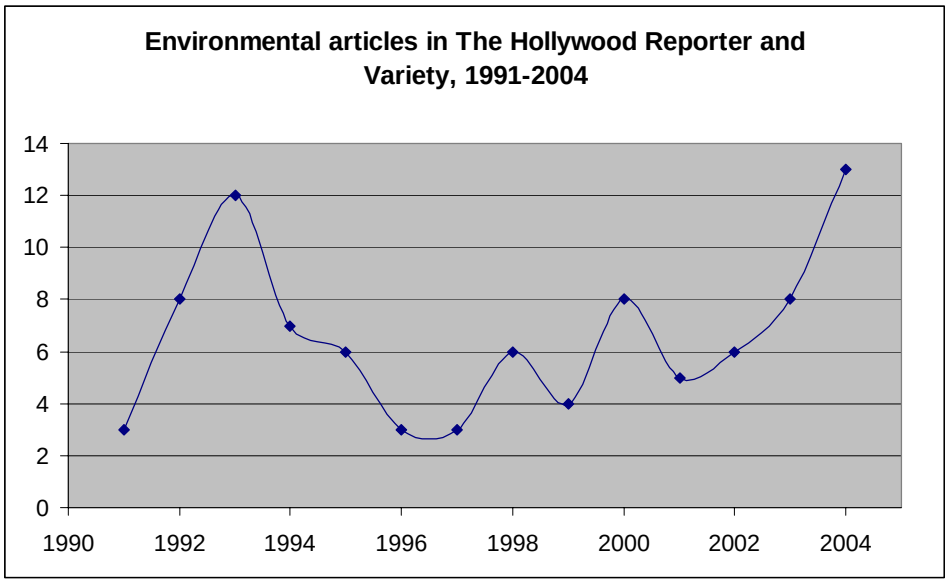
[4] As of the writing of this report, some tentative discussions had been held with a production company about such a case study.

This analysis is purely for illustrative purposes, it is clear that one can repeat the analysis with many other combinations of search terms, inclusion criteria, etc. While the precise numbers may change, the qualitative findings appear robust.

Findings

With the approach above, the number of articles selected during 1991-2004 is as shown in Figure 1 on the next page:

Figure 1: Selected articles with environmental theme in trade publications



This cursory analysis suggests that the recent increase in attention awarded to environmental issues in the motion picture industry is not new. In fact, the early 1990s saw a peak of interest in environmental issues at roughly the same level as more recently in 2004, an interest which tapered off during the mid- to late-1990s, only to be reignited during 2002-2004.

In Appendix E, we provide a summary overview of the type of environmental reporting found in *The Hollywood Reporter* and *Variety* during this interval to illustrate the nature of environmental issues discussed. From the articles listed there, it is clear that the large majority of writings in entertainment industry publications focuses on environmental content rather than environmental aspects of industry operations.

Until 2003, the EMA awards focused fully on films and shows that include environmental messages; the 2004 awards included a separate category for environmental process improvements based on EMA's Green Seal checklist. There is also significant focus on environmental activities by celebrities, but again these activities are usually not directly connected to the operations of the shows or films they are involved in. For instance, there are reports of celebrities meeting with the President to promote an environmentally-themed Earth Day special they were involved in, but there is no mention of employing environmental practices in the production of that special.

In short, it appears that the motion picture and TV industry has demonstrated significant interest in environmental issues, both in the early 1990s and again since 2002, but that the

bulk of this interest manifests itself in environmental content of shows and films and in environmental activism and philanthropy of celebrities, rather than in industry operations.

Environmental Impacts of the Motion Picture Industry: The Macro View

In this section, we estimate the total environmental impacts associated with the motion picture industry in terms of conventional air pollutants released, energy consumption, greenhouse gas emissions, hazardous waste, and fatalities. We report results for the industry per $1 million of output, then limited to the economic activity of the industry in the Los Angeles metropolitan area, then for California, and finally for the US-wide activity of the industry. We compare these impacts to those associated with the aerospace, apparel, hotel, petroleum refining, and semiconductor industries. We conclude that energy consumption is a major component of the overall environmental impacts of the motion picture industry. We report on total consumption of oil and tires by the industry, and again compare that consumption with the same benchmark industries.

Methodology

In order to know where to focus in studying environmental impacts and practices of the motion picture industry, it would be helpful to have a high-level assessment of what the main environmental impacts are and how they compare to the impacts resulting from other business sectors. Unfortunately, given the highly decentralized nature of the industry, with many thousands of small firms and independent contractors alongside a limited number of major studios, one cannot start by determining the emissions associated with individual sources and aggregate these to the level of the entire industry.

Instead, we use a top-down approach, based on the Economic Input-Output Life Cycle Assessment (EIOLCA) method developed by the Green Design Initiative at Carnegie-Mellon University.[5] For a more complete description of the method, please refer to the website. In brief, the method consists of an input-output analysis step, and an emissions coefficient step.

The input-output model divides the US economy into 485 sectors, and determines economic links between each of these sectors. Firms in the motion picture industry, for instance (sector 760101 in their model), purchase goods and services from other firms in the industry and from firms in the remaining 484 sectors. These are the first-order purchases. Each of the firms, in turn, purchases goods and services from firms in all sectors, the second-order purchases, etc. Input-output analyses aggregate all these first-order, second-order, and higher-order purchases, to determine the total economic activity generated per $1 of final output in the motion picture industry. $1 of final output in the motion picture industry generates a total economic activity of $2.168203. Of this, $1.494154 consists of activity generated within the motion picture industry itself; $0.110935 consists of advertising; $0.078514 consists of real estate agents, managers,

[5] Available at www.eiolca.net. See Hendrickson, C., A. Horvath, S. Joshi and L.B. Lave, "Economic Input-Output Models for Environmental Life Cycle Analysis," *Environmental Science & Technology*, April, 1998, for more detail on the estimation methods. The suggested correct citation for this method is "Carnegie Mellon University Green Design Institute. (2005), Economic Input-Output Life Cycle Assessment (EIO-LCA) model [Internet], Available from: <http://www.eiolca.net/> [Accessed 22 May, 2005.]"

operators and lessors; $0.024613 consists of magnetic and optical recording media; $0.016153 consists of electric services from utilities; etc.[6]

The second step in the method consists of multiplying the life-cycle economic impact for each sector obtained from the input-output model with emissions coefficients for each sector. These emissions coefficients used by the Green Design Initiative are obtained from a wide variety of sources, including the U.S. Census of Manufacturers, the U.S. EPA, the U.S. Department of Commerce, and the U.S. Bureau of Labor Statistics.[7]

The EIOLCA method calculates a wide range of environmental impacts; the results we report below are based on the summary impacts provided, which include total electricity used (in mega kilowatt-hours), energy used (in terajoules), conventional pollutants released, (in metric tons) greenhouse gases released (in metric tons CO_2 equivalents), fatalities, hazardous waste generated (in metric tons), and others. In this way, one can calculate the environmental impacts along each of these dimensions associated with $1 of final output in any particular sector.[8] To determine the total life-cycle environmental impacts associated with a particular sector, one can multiply the size of that sector with these emissions per $1.

To estimate the size of each sector, we use data on "value of shipments" from the US Census Bureau from the 1997 Economic Census. This is defined as including "the total sales, shipments, receipts, revenue, or business done by establishments within the scope of the economic census."[9] We use the value of shipments for the motion picture industry and several other comparison sectors, for the Los Angeles metropolitan area (defined as Los Angeles County, Orange County, Riverside County, San Bernardino County and Ventura County), for California, and for the entire US.[10] In doing so, we need to correct for the fact that the EIOLCA method is based on "final output" which excludes sales from a sector to the same sector. In the case of the motion picture industry, we noted that $1 of final output corresponded to a total of $1.494154 of economic activity within the motion picture industry. The "value of shipments" figures from the Census Bureau do not differentiate whether the shipments remain within the industry or not; to translate them

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[6] These numbers were obtained by entering sector number 760101 at www.eiolca.net, then selecting the "economic" data source; on May 22, 2005.

[7] See http://www.eiolca.net/methods.html for a full list of the data sources used.

[8] See http://www.eiolca.net/methods.html for a full list of the environmental impacts provided and the methods used to determine them.

[9] See http://www.census.gov/epcd/ec97brdg/def/ECVALUE.HTM, last accessed May 22, 2005. For the information sector, which includes motion pictures and television, the following detail is offered:

> "Includes receipts from customers or clients for services rendered, from the use of facilities, and from merchandise sold during 1997, whether or not payment was received in 1997. Receipts include royalties, license fees, and other payments from the marketing of intangible products (e.g., licensing the use of or granting reproduction rights for software, musical compositions, and other intellectual property). Receipts also include the rental and leasing of vehicles, equipment, instruments, tools, etc.; total value of service contracts; market value of compensation received in lieu of cash; amounts received for work subcontracted to others; dues and assessments for members and affiliates; this establishment's share of receipts from departments, concessions, and vending and amusement machines operated by others. Receipts from services provided to foreign customers from U.S. locations, including services preformed for foreign parent firms, subsidiaries, and branches are included. For public broadcast stations and libraries, include receipts from contributions, gifts, grants, and income from interest, rental of real estate, and dividends."

[10] See http://www.census.gov/epcd/ec97/us/US000.HTM for the front page of the summary statistics of the U.S. Census Bureau data on the 1997 Economic Census. Last accessed May 22, 2005.

into “final shipments,” we divide the total value of shipments by the multiplier $1.494154. We do the same for all sectors, using the appropriate multiplier for that sector; perhaps unsurprisingly, this multiplier is far larger for the motion picture industry than for the other sectors we looked at, ranging from 1.00062 for the aerospace industry to 1.129361 for the apparel industry.[11]

Sectors Studied

Though the analysis focuses on the motion picture and television industry, we selected several other industries which are relevant in California as a basis for comparison: aerospace, petroleum refining, apparel, hotels, and semiconductor manufacturing. These sectors were chosen to include a benchmark that is thought of as highly polluting, such as petroleum refining and a benchmark that is thought of as clean, such as hotels, and a few other sectors which have significant presence in Los Angeles and in California, such as apparel, aerospace, and semiconductors. The definitions of each of these industries are given below.

Motion Picture and Television Industry

This sector is represented by NAICS code 512[12] and Commerce sector number 760101 in the EIOLCA method. The NAICS definition of the industry is:

> “NAICS 512: Motion Picture and Sound Recording Industries
>
> Industries in the Motion Picture and Sound Recording Industries subsector group establishments involved in the production and distribution of motion pictures and sound recordings. While producers and distributors of motion pictures and sound recordings issue works for sale as traditional publishers do, the processes are sufficiently different to warrant placing establishments engaged in these activities in a separate subsector. Production is typically a complex process that involves several distinct types of establishments that are engaged in activities, such as contracting with performers, creating the film or sound content, and providing technical postproduction services. Film distribution is often to exhibitors, such as theaters and broadcasters, rather than through the wholesale and retail distribution chain. When the product is in a mass-produced form, NAICS treats production and distribution as the major economic activity as it does in the Publishing Industries subsector, rather than as a subsidiary activity to the manufacture of such products.
>
> This subsector does not include establishments primarily engaged in the wholesale distribution of video cassettes and sound recordings, such as compact discs and audio tapes; these establishments are included in the Wholesale Trade sector. Reproduction of video cassettes and sound recordings that is carried out separately from establishments engaged in production and distribution is treated in NAICS as a manufacturing activity.”[13]

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[11] These multipliers are all based on the U.S.-wide structure of the economy; in future versions of this study, we will need to determine multipliers for the Los Angeles metro area and for California separately.
[12] NAICS is the North American Industry Classification System, which replaced the Standard Industrial Classification (SIC) system. See http://www.census.gov/epcd/www/naics.html for more on NAICS and SIC codes.
[13] See http://www.census.gov/epcd/ec97/def/512.HTM; last accessed May 20, 2005.

Aerospace

This sector is represented by NAICS code 3364 and Commerce sector number 600100 in the EIOLCA method. The NAICS definition of the industry is:

> "NAICS 3364: Aerospace Product and Parts Manufacturing
>
> This NAICS Industry Group includes establishments classified in NAICS Industry 33641, Aerospace Product and Parts Manufacturing."[14]

NAICS 33641 is defined as follows:

> "NAICS 33641: Aerospace Product and Parts Manufacturing
>
> This industry comprises establishments primarily engaged in one or more of the following: (1) manufacturing complete aircraft, missiles, or space vehicles; (2) manufacturing aerospace engines, propulsion units, auxiliary equipment or parts; (3) developing and making prototypes of aerospace products; (4) aircraft conversion (i.e., major modifications to systems); and (5) complete aircraft or propulsion systems overhaul and rebuilding (i.e., periodic restoration of aircraft to original design specifications)."[15]

Petroleum Refining

This sector is represented by NAICS code 324 and Commerce sector number 310101 in the EIOLCA method. The NAICS definition of the industry is:

> "NAICS 324: Petroleum and Coal Products Manufacturing
>
> The Petroleum and Coal Products Manufacturing subsector is based on the transformation of crude petroleum and coal into usable products. The dominant process is petroleum refining that involves the separation of crude petroleum into component products through such techniques as cracking and distillation.
>
> In addition, this subsector includes establishments that primarily further process refined petroleum and coal products and produce products, such as asphalt coatings and petroleum lubricating oils. However, establishments that manufacture petrochemicals from refined petroleum are classified in Industry 32511, Petrochemical Manufacturing."[16]

Apparel

This sector is represented by NAICS code 315 and Commerce sector number 180400 in the EIOLCA method. The NAICS definition of the industry is:

> "NAICS 315: Apparel Manufacturing
>
> Industries in the Apparel Manufacturing subsector group establishments with two distinct manufacturing processes: (1) cut and sew (i.e., purchasing fabric and cutting and sewing to make a garment), and (2) the manufacture of garments in establishments that first knit fabric and then cut and sew the fabric into a garment. The Apparel Manufacturing subsector includes a diverse range of

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[14] See http://www.census.gov/epcd/ec97/def/3364.HTM; last accessed May 22, 2005.
[15] See http://www.census.gov/epcd/ec97/def/33641.HTM; last accessed May 22, 2005.
[16] See http://www.census.gov/epcd/ec97/def/324.HTM; last accessed May 20, 2005.

establishments manufacturing full lines of ready-to-wear apparel and custom apparel: apparel contractors, performing cutting or sewing operations on materials owned by others; jobbers performing entrepreneurial functions involved in apparel manufacture; and tailors, manufacturing custom garments for individual clients are all included. Knitting, when done alone, is classified in the Textile Mills subsector, but when knitting is combined with the production of complete garments, the activity is classified in Apparel Manufacturing."[17]

Hotels

This sector is represented by NAICS code 7211 and Commerce sector number 720101 in the EIOLCA method. The NAICS definition of the industry is:

> "NAICS 7211: Traveler Accommodation
>
> This NAICS Industry Group includes establishments classified in the following Industries: 72111, Hotels (except Casino Hotels) and Motels; 72112, Casino Hotels; and 72119, Other Traveler Accomodation."[18]

Semiconductors

This sector is represented by NAICS code 3344 and Commerce sector number 570200 in the EIOLCA method. The NAICS definition of the industry is:

> "NAICS 3344: Semiconductor and Other Electronic Component Manufacturing
>
> This NAICS Industry Group includes establishments classified in NAICS Industry 33441, Semiconductor and Other Electronic Component Manufacturing."[19]

NAICS 33441 is defined as:

> "NAICS 33441: Semiconductor and Other Electronic Component Manufacturing
>
> This industry comprises establishments primarily engaged in manufacturing semiconductors and other components for electronic applications. Examples of products made by these establishments are capacitors, resistors, microprocessors, bare and loaded printed circuit boards, electron tubes, electronic connectors, and computer modems."[20]

Results

For each category of environmental impacts, four charts are shown. Clockwise, from left top, the first shows the emissions (across the entire U.S.) associated with $1 million of final output of each of the sectors we consider. The second shows the emissions (across the entire U.S.) associated with each sector's economic activity in the Los Angeles metropolitan region.[21] That is, economic activity that takes place in the Los Angeles region causes emissions elsewhere, by purchasing materials and energy from other

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[17] See http://www.census.gov/epcd/ec97/def/315.HTM; last accessed May 20, 2005.
[18] See http://www.census.gov/epcd/ec97/def/7211.HTM; last accessed May 20, 2005.
[19] See http://www.census.gov/epcd/ec97/def/3344.HTM; last accessed May 22, 2005.
[20] See http://www.census.gov/epcd/ec97/def/33441HTM; last accessed May 22, 2005.
[21] The U.S. Census Bureau does not provide the value of shipments for petroleum refining in the Los Angeles metropolitan area; this data is listed as "withheld to avoid disclosure." See http://www.census.gov/epcd/ec97/metro4/M4472_31.HTM, last accessed May 22, 2005.

regions. This chart shows all such emissions, nationwide, associated with the level of economic activity in the Los Angeles metropolitan region. The third chart shows the nationwide emissions associated with the economic activity of each of the sectors in California. The fourth chart shows the nationwide emissions associated with the nationwide economic activity in the sector studied.[22] (Recall that the first chart shows the nationwide emissions associated with $1 million output in the sector under investigation.)

Below, we first discuss the results for conventional pollutants, energy consumption, greenhouse gas emissions, hazardous waste generated, and fatalities. After that, we provide a brief discussion of limitations of this method. It should be emphasized that the nature of the data and analysis used lead to major uncertainty about the accuracy of the results, so the findings reported below should be interpreted, at best, as indications of relative orders of magnitude rather than precise estimates of impacts.

Conventional Pollutants

In the EIOLCA analysis, "conventional" air pollutants are defined as the basic primary "criteria" pollutants, such as nitric oxide and carbon monoxide, which are emitted from a wide range of sources. It is generally these criteria pollutants whose concentrations are controlled by air quality regulations. Note that each of the primary or criteria pollutants leads to different environmental impacts and health effects. Accordingly, the crude methodology of combining the total mass of such emissions is designed only to provide a rough relative measure of potential air quality impacts. The data cannot be used to make any meaningful qualitative assessment of local, regional or national air quality consequences.

This is a summary of air pollutant releases from the U.S. EPA AIRS database, which appears to focus on point sources although the database is no longer current.[23] For the motion picture industry, this would likely consist primarily of air emissions at power stations supplying electricity to the motion picture industry.

Unsurprisingly, per $1 million output, petroleum refining releases the most air emissions; perhaps less expected, all five other sectors are within a factor of two of one another. Within the Los Angeles metropolitan area, the size of the motion picture industry makes it the largest contributor to conventional air pollution of the five sectors for which we can determine the total emissions associated with the activity in the Los Angeles area.

Recall, again, that these emissions do not necessarily occur in the Los Angeles area: studios and other firms based in the Los Angeles area purchase materials and energy from other regions, contributing to emissions there too, and the chart shows all such emissions regardless of where they occur. Statewide, the economic size of the motion picture industry still leads to conventional air pollutants of magnitude comparable to that of the aerospace industry and not far behind semiconductor manufacturing. In the nationwide analysis, the relative magnitude of the contribution of the motion picture industry, of course, diminishes further, relative to the other industries studied.

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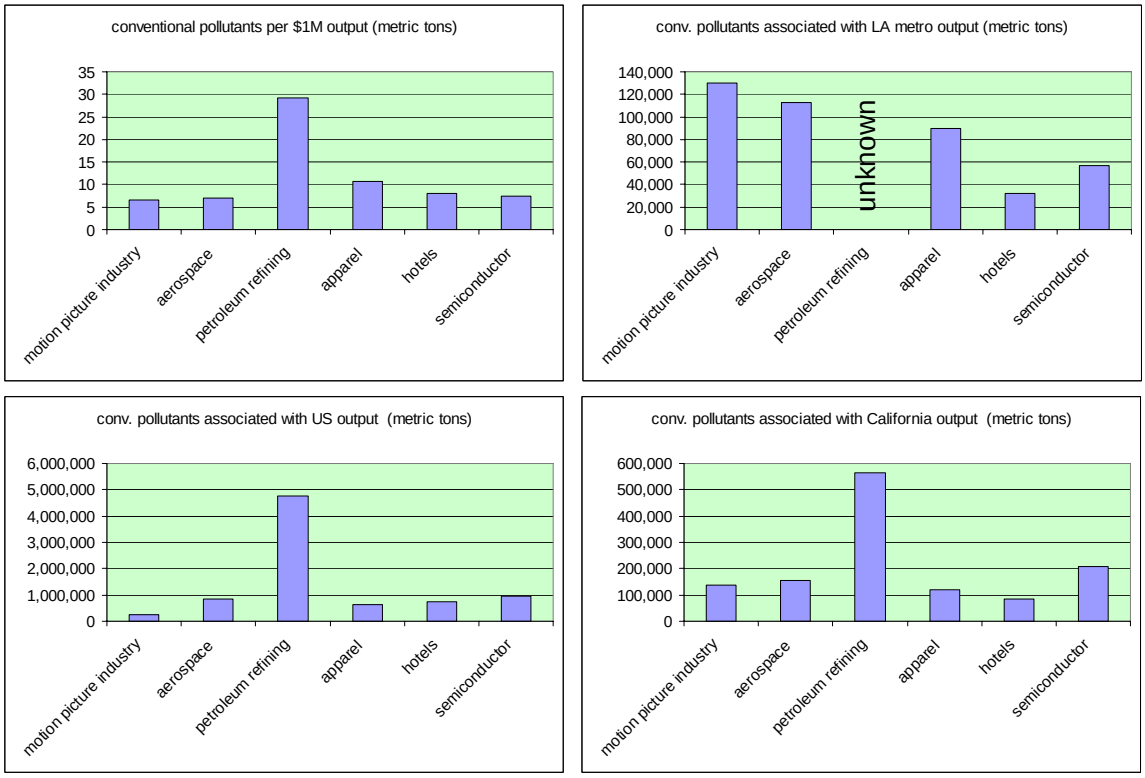
[22] These estimates were produced at various points in time. The estimates reported here are based on data provided by www.eiolca.net on July 3, 2005.

[23] See http://www.eiolca.net/methods.html, last accessed May 22, 2005. The current fundamental EPA database is the National Emissions Inventory (http://www.epa.gov/ttn/chief/eiinformation.html). The NEI includes both point and non-point (area) sources, as well as mobile on-road and off-road sources.

Figure 1: Conventional pollutants (metric tons) for selected sectors

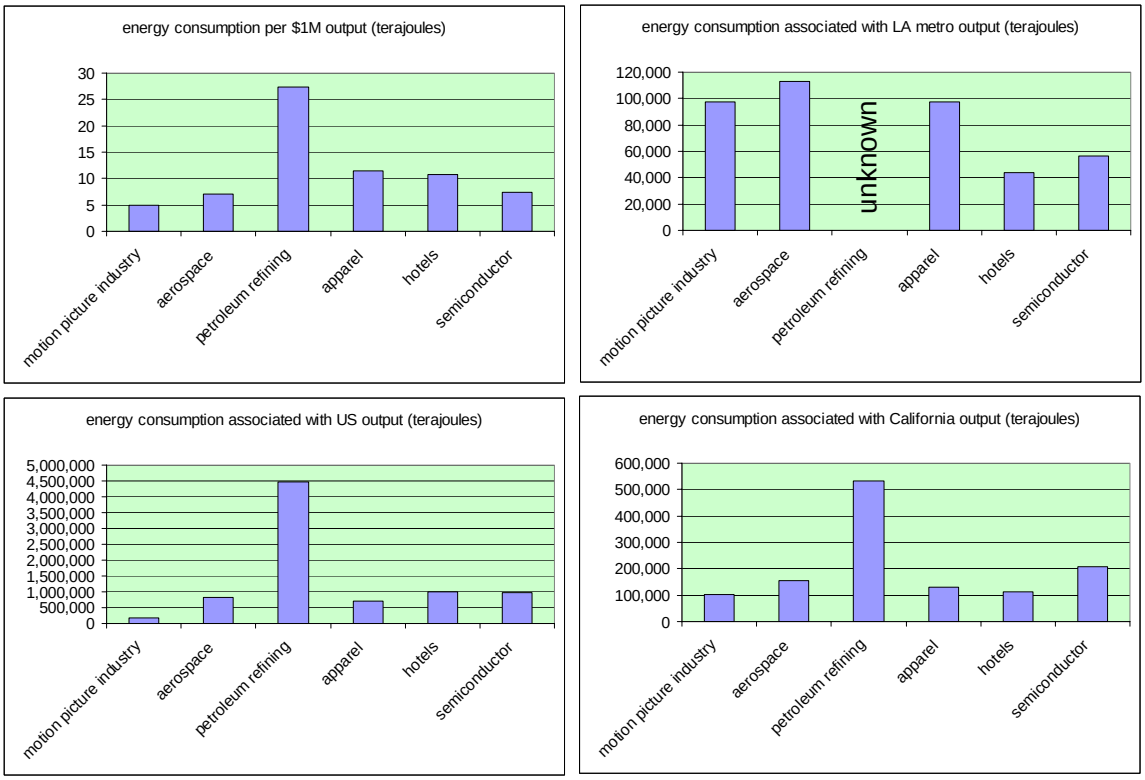


Energy

This is a summary of energy consumption, both in the form of fuels and electricity.[24] One can make observations similar to those above for conventional pollutants: although petroleum refining consumes far more energy per $1 million of output, energy consumption in the motion picture industry again appears to be smaller but within the same order of magnitude as that of our other comparison sectors. The size of the industry in the Los Angeles area again makes the motion picture industry a significant consumer of energy, while at the state level, it is again comparable to the other industries we considered (with the exception of petroleum refining).

[24] See http://www.eiolca.net/methods.html, last accessed May 22, 2005.

Figure 2: Energy consumption (terajoules, TJ) for selected sectors

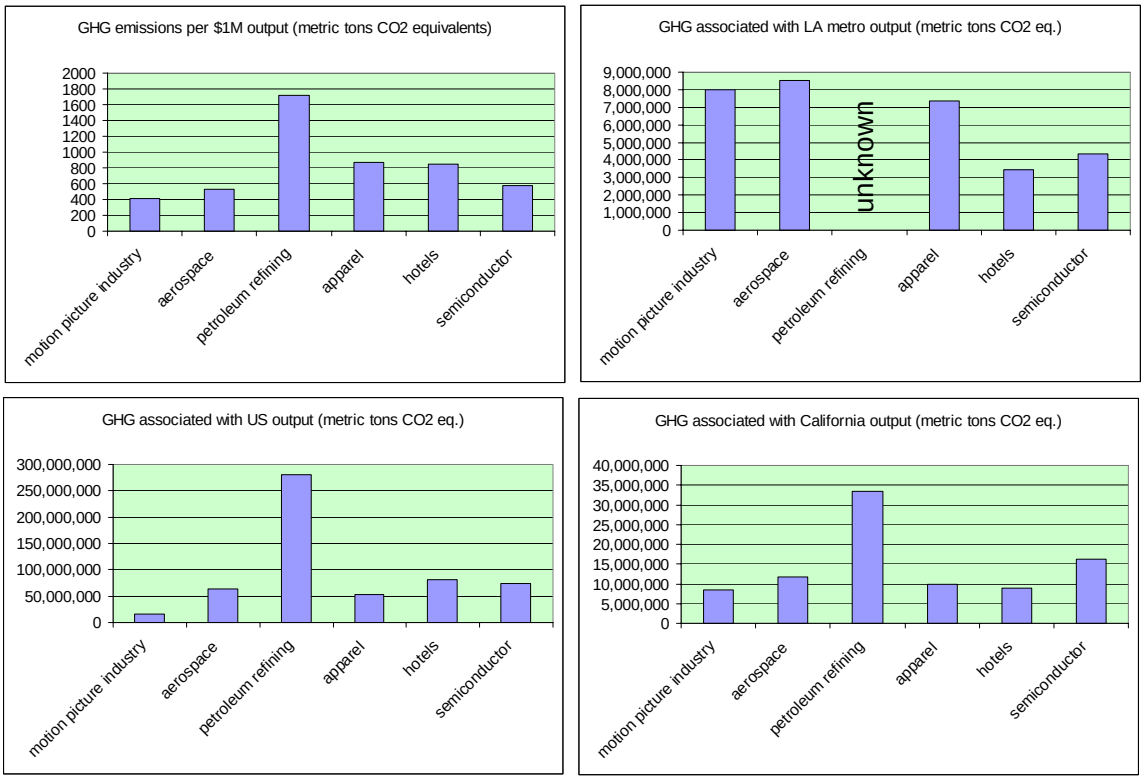


Greenhouse Gas Emissions

This is based on fuel consumption, using various conversion factors to reduce CO_2, methane, and N_2O emissions to a single global warming potential value, expressed in metric tons of CO_2 equivalents.[25] The observations one can draw are largely identical to those for conventional pollutants and for energy usage.

[25] See http://www.eiolca.net/methods.html, last accessed May 22, 2005.

Figure 3: Greenhouse gas emissions (metric tons, CO_2 equivalents) for selected sectors



To put this in perspective, consider the following. As we discuss later, in the environmental best practice section on *The Day After Tomorrow*, the greenhouse gas emissions associated with the production of that film were estimated (by Future Forests) to be 10,000 tons CO_2-equivalent.[26] Using data from the Motion Picture Association of America (MPAA), Vogel (2001) shows that the MPAA member companies released 218 films in 1999[27], at an average cost of $51.5 million.[28] The budget for *The Day After Tomorrow* was estimated at $125 million. Scaling greenhouse gas emissions proportionately to the films' budgets would mean that the average release in 1999 caused 10,000 x 51.5/125 = 4120 tons of GHG emissions; multiplying this by the 218 releases in 1999 would give an estimated total of 898,160 tons of GHG emissions directly associated with production of feature films. This estimate is clearly extremely rough and possibly an underestimate; for instance, it is possible that the methodology used by Future Forests only counts GHG emissions that are directly caused by a project, not the indirect emissions associated with office space for ancillary services and other indirect emissions.

Note from the graph that the total GHG emissions of the motion picture (and television) industry in the Los Angeles metropolitan area are approximately 8 million tons of CO_2 equivalent. The figures for California and the U.S. are 8.4 million tons and 15 million tons respectively.

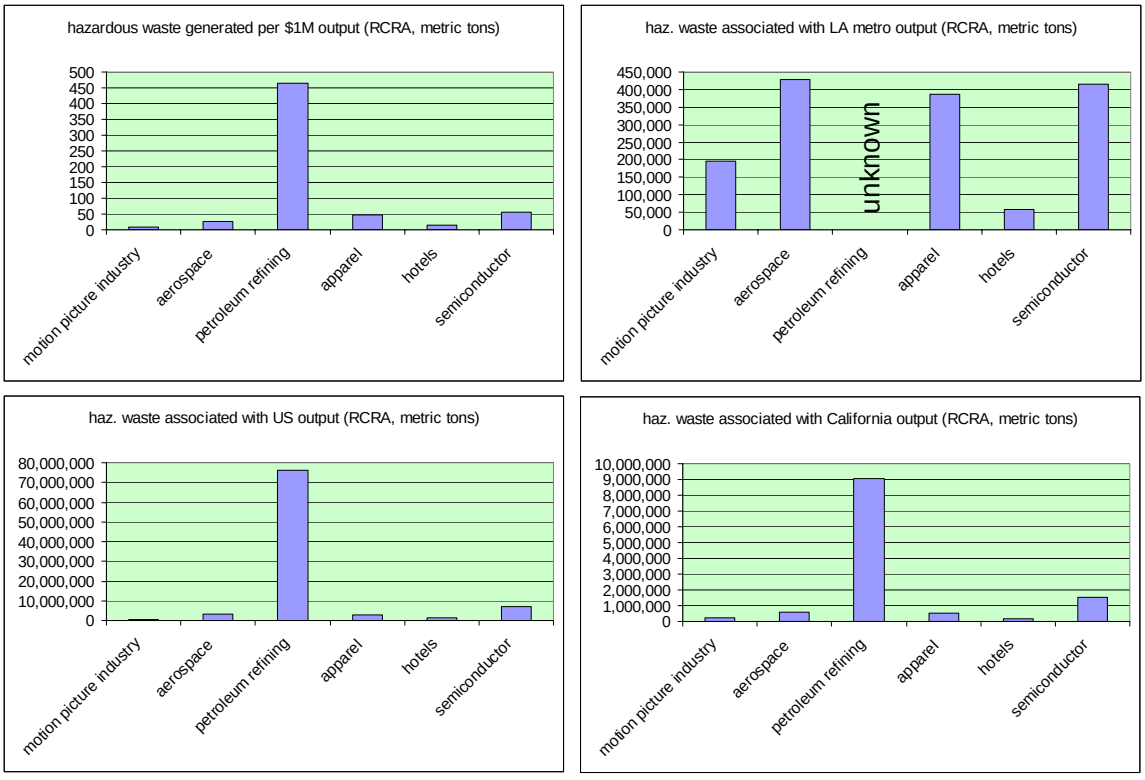
[26] See the detailed discussion of *The Day After Tomorrow* later in this report for details and sources of information on *The Day After Tomorrow*.
[27] Vogel (2001), Table 2.4, page 54.
[28] Vogel (2001), Table 3.2, page 80.

The difference between the estimate of 898,160 tons of GHG emissions associated with feature films in 1999 and that of almost 8 million tons of GHG emissions associated with the motion picture industry's activity in the Los Angeles metropolitan area suggests several causes. First, television production is most likely a significant factor that is not included in the estimate of GHG emissions associated with feature films. Second, GHG emissions that are caused by the industry but not associated with specific films or television shows are likely to be a significant factor. This would include GHG emissions associated with studio offices, buildings and other offices operated by other service providers (lawyers, advertising agencies, catering firms, etc.), possibly employee commuting, etc.

Hazardous Waste

This is RCRA (Resource Conservation and Recovery Act) Subtitle C hazardous waste generated, managed and shipped.[29] The motion picture industry has considerably smaller impacts on this dimension than most other industries. In the Los Angeles area, the apparel sector appears to generate more hazardous waste than the motion picture industry, possibly a result of use of dyes and solvents. The degree to which petroleum refining dominates the other sectors is even stronger here than for the other environmental impacts considered.

Figure 4: Hazardous waste generated (metric tons) for selected sectors



Fatalities

Though not usually considered an environmental metric, matters related to health, safety and environment are often handled by the same department in firms, including several

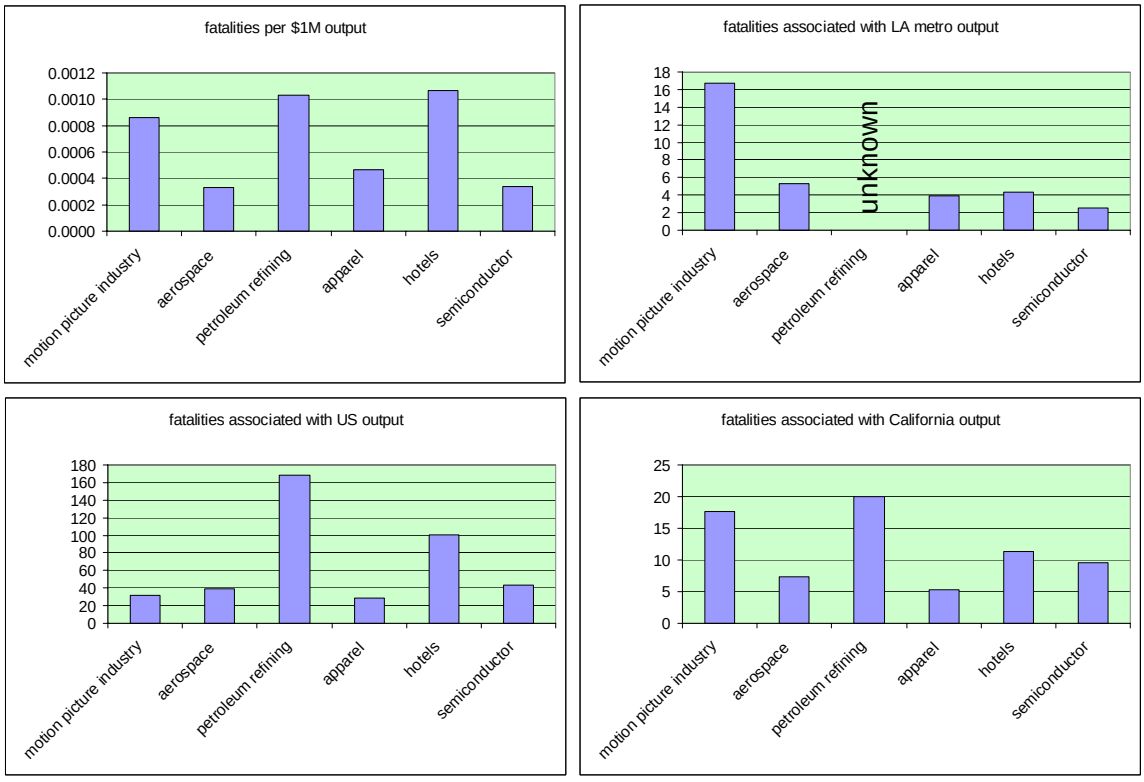
[29] See http://www.eiolca.net/methods.html, last accessed May 22, 2005.

major studios in the motion picture industry. Moreover, a study of sustainability should include other measures of human well-being than purely environmental ones. This metric consists of the number of injuries resulting in death.[30]

The results here are perhaps surprising. Of the sectors included, the hotel sector, petroleum refining, and the motion picture industry all had similar fatality rates per $1 million output, with aerospace, apparel and semiconductors considerably lower. The relatively high (relative to some other sectors) fatality rate within the motion picture industry, combined with its size, makes it the sector with the largest number of fatalities of the six sectors we studied, in the Los Angeles area, and even statewide a close second to the petroleum refining sector.

This finding makes the discussion provided later in this report on the recently adopted Safety Passport program all the more relevant, though (as for all these estimates) one must recognize that there are significant uncertainties inherent in the data. Moreover, not all these fatalities need occur within the MPI itself, as the EIOLCA approach again includes fatalities in industries supplying the MPI. In addition, we should emphasize that these data (except the upper left chart) are absolute numbers, not fatality rates per employee; the number of paid employees in the motion picture industry in California is 98,151,[31] while the corresponding number for petroleum refining in California is 12,755,[32] showing that the fatality rate per employee is higher in petroleum refining than in the motion picture industry.

Figure 5: Fatalities (occupational injuries resulting in death) for selected sectors



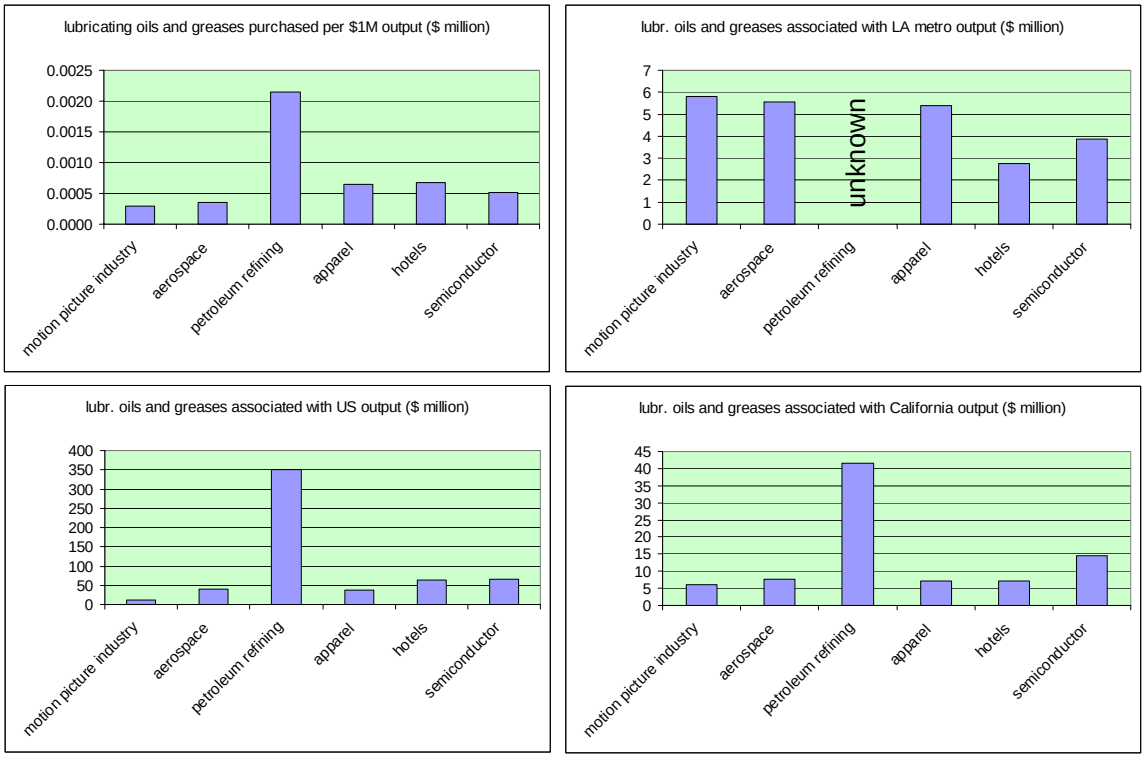
[30] See http://www.eiolca.net/methods.html, last accessed May 22, 2005.
[31] See http://www.census.gov/epcd/ec97/ca/CA000_51.HTM, last accessed January 22, 2006.
[32] See http://www.census.gov/epcd/ec97/ca/CA000_31.HTM, last accessed January 22, 2006.

Oil and Tire Consumption

Using the same EIOLCA method, we can estimate the total usage of oil (lubricating oils and greases) and tires (tires and inner tubes) associated with the economic activity of the sectors included in our analysis. For oil consumption, the observations are largely similar to those made previously: per $1 million output, the motion picture industry consumes far less oil than petroleum refining but falls within the same general order of magnitude as our benchmark sectors. As a result, again, of the size of the industry in the Los Angeles area, the motion picture industry is a large consumer of oil within the region, on a par with the other sectors (except petroleum refining) at the state level, and a relatively minor consumer at the national level.

With respect to tire usage, on the other hand, the motion picture industry is a major consumer even at the state level. Within the Los Angeles region, the industry uses far more tires than any of the other sectors we considered, (over $10 million in purchases, based on 1997 estimates of the size of the industry and 1992 estimates of purchase patterns, compared to a little over $7 million for the next highest sector[33]). Statewide, the motion picture industry accounts for approximately $10.7 million in tire purchases, compared to a little over $11.5 million for semiconductor manufacturing, the second largest tire user in our analysis.[34]

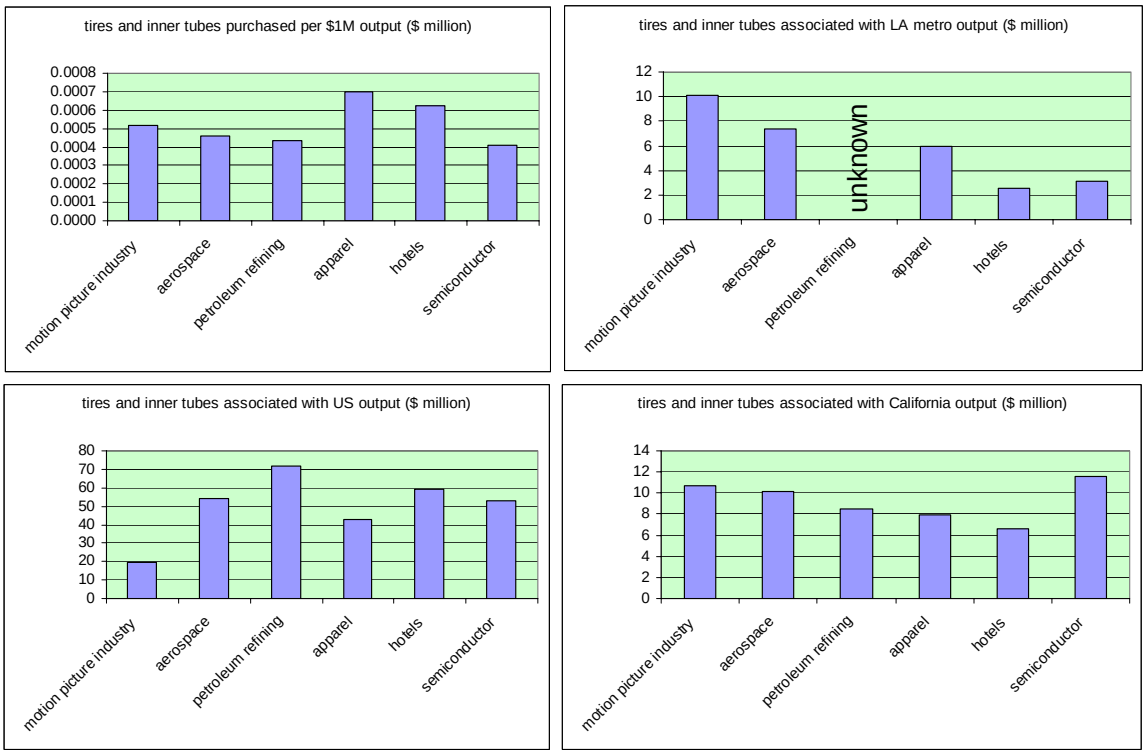
Figure 6: Lubricating oil consumption ($ million), for selected sectors



[33] Although we do not have a specific estimate for tire purchases resulting from economic activity in petroleum refining in the Los Angeles area, that economic activity is of course no greater than that across the entire state, from which we can infer an upper bound on the tire purchases due to petroleum refining in the Los Angeles area.

[34] In presenting these specific figures, we should also emphasize the large uncertainty inherent in the data; the limitations of the analysis are discussed more extensively at the end of this section.

Figure 7: Tires purchased ($ million), for selected sectors



Limitations

The nature of the data used in the above analysis leaves room for considerable uncertainty, meaning that these findings should, not under any circumstance, be interpreted as anything more than, at best, an indication of relative orders of magnitude of environmental impacts of different sectors. The major categories of uncertainty include:[35]

- Much of the data on which the EIOLCA method is based is self-reported and often not externally verified.
- Firms with low emissions are often not required to report emissions at all, so an industry consisting of large numbers of minor firms is likely to have higher aggregate emissions than reported. Some of the data sources used in EIOLCA, such as the toxics release inventory, are only applicable to selected industries and even then only to establishments above certain reporting thresholds.
- The definition of "value of shipments" in the motion picture industry is not unambiguous, and especially it is not certain how the definition used by the US Census Bureau relates to the notion of "output" used by the EIOLCA method.
- The EIOLCA input-output matrix is based on 1992 data from the U.S. Department of Commerce. The structure of some industries is likely to change faster than others; for instance, the motion picture industry makes far more use of computer-generated graphics in 2005 than it did 1992, which will lead to some changes in the structure of the input-output matrix.

[35] See also http://www.eiolca.net/methods.html for more discussion of sources of uncertainty in the data.

- The size of each sector was based on the 1997 Economic Census, and the rate of growth since then of the six industries we considered does vary.

Conclusions

From the above analysis, we can tentatively conclude that the main environmental impact of the motion picture and television industry is associated with its energy usage. This is not to say that the solid waste or hazardous waste streams are insignificant, but those streams are more visible and have already attracted more attention within the industry, as highlighted in some of the best practice cases later in this report. Energy consumption, however, tends to be invisible, but, aggregated over the many individuals and firms active in the industry, becomes a significant factor. Tire usage is a similarly invisible environmental impact that, aggregated over a large number of individuals driving, becomes a significant factor.

Environmental Impacts of the Motion Picture Industry: The Micro View

This section describes our findings from the interviews we conducted. The objective of the interviews was to obtain a richer understanding of how the motion picture industry operates in general and what opportunities and challenges exist for environmental programs in particular.

The section first describes the respondent sample, then discusses our findings, arranged by topic area, and ends with our assessment of obstacles for environmental initiatives in the industry.

Description of Sample

We conducted semi-structured interviews with 43 individuals from a range of areas within the motion picture and television industry. The full list of interviewees is provided in Appendix A; the questions asked varied across interviewees, depending on their position within the industry and their experience and knowledge. It covers most key functions above and below the line,[36] studio representatives and independents, from the business and creative sides of the industry, from the film and television side, and several from governmental and private organizations associated with the industry. The main missing categories are actors, (who are notoriously hard to get access to) and directors of photography, (who play an important role during the shoot).

[36] Singleton (1996, page 8) explains the terms “above-the-line” and “below-the-line” as follows: “All feature budgets [...] retain the style of *the studio system*, in which a line is drawn across the top sheet. Above that line (Above-the-Line) are all the so-called artistic or creative components. Below (Below-the-Line) are all the technical and mechanical components.” Singleton (1996, page 413) elaborates: “Above-the-line expenditures are usually negotiated on a run of show basis and, generally, are the most expensive individual items on the budget. They include costs for story and screenplay, producer, director, and cast. Below-the-line costs include technicians, materials and labor. Labor costs are usually calculated on a daily basis. Also included in below-the-line costs are: raw stock, processing, equipment, stage space and all other production and post production costs.”

The Players

One key feature of the industry is the degree to which it is decentralized. The 7 major studios are likely the most visible part of the industry; most major distribution companies are owned by these 7 major studios. Scott (2002, page 962) provides an overview of the linkages between these 7 studios and their subsidiaries.[37] However, a large part of the work is done by individuals who are temporarily employed by production companies, for (part of) the duration of a specific film or television project. These production companies may be linked to any of the major studios, or may be independent. The independent production companies exist in a largely separate sphere from the major studios; according to Scott (2002, pages 962-963) they "rarely come into contact with a major, and work in an entirely separate sphere of commercial and creative activity." That said, individuals may sometimes work for a production company affiliated with a major studio, and other times with independent production companies.

Storper (1989) describes how the vertically-integrated studio system was gradually transformed into the vertically disintegrated system that prevails today. DeFillippi and Arthur (1998) describe the challenges faced by production companies as a result of growing from zero to 150 or more employees within a few months, and then winding down to almost none a year or two later. These 150+ employees cover a very wide range of functions, including the obvious categories such as writers, actors, directors and producers, but also wardrobe coordinators, animal handlers, generator operators, and many others.

A good overview of functions involved in motion pictures and television production, both above the line and below the line, is given in the U.S. Department of Commerce Report on Runaway Production (2001, page 11). Jones (2003) breaks this down further, showing which personnel are typically needed in films of various budget sizes. Because there are several excellent descriptions of these functions, we do not review them systematically here; instead, we only discuss those aspects of each function that are relevant for our study of environmental practices in the industry.

The executive producer, producer and the director are the central figures in a production, where the balance of power varies between film, where producer and especially director are key, and television, where the executive producer is more influential.[38] The producer hires the line producer, who in turn hires the department heads.[39] "Each set has a different emotional tenor; different values and culture. But, for television, the network has ultimate decision-making power."[40]

Television is run more like a business than film; one interviewee characterized the bulk of film as "rich person's play."[41] Indeed, one interviewee believed that television would

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[37] Scott (2002) lists the following 7 majors: The Walt Disney Company (which includes Miramax, Buena Vista, Touchstone, and Dimension), Sony Corporation (including Columbia Tristar), AOL Time-Warner (including Warner Brothers, Castle Rock, New Line, and others), Metro-Goldwyn-Mayer Inc.(including United Artists and Orion), News Corporation (including Twentieth Century Fox Film), Vivendi-Universal and Viacom (including Paramount). Metro-Goldwyn-Mayer, Inc. is currently in merger proceedings with a consortium which includes Sony Corporation of America and Comcast Corporation. See http://www.mgm.com/corp_news_releases.do?id=424, last accessed April 25, 2005.
[38] Source: interview.
[39] Source: interview.
[40] Source: interview.
[41] Source: interview.

be a better part of the industry to focus on in implementing environmental practices, as it's easier to control, and "greening high-profile would have a lot of impact."[42] By contrast, the realm of commercials is even more dispersed among small companies that have even less environmental practices in place than any other part of the industry.[43]

In one interviewee's words: "The producer and line-producer are the ones who have to create a system and set the tone for an environmentally conscious production."[44] Some producers do strongly care about the environmental impacts of their work; a costume designer noted the example of a producer who "is always good about making others aware of the environment. At the first major production meeting he will say to us, "Let's make sure we're aware of our location, that we respect it and leave it the way we found it."[45] Change in behavior has to be driven by the top down.[46] However, the producer does not always have much direct influence over the crew; sometimes the producer is respected at a distance, sometimes not, though they do have more influence in a studio production.[47] The line producer is the person who will mandate any specific practices,[48] such as telling craft services to recycle.[49]

The director hires the art director and the director of photography, while the producer has little to say. The producer hires people to come and clean up after the shoot. The director of photography is the "below-the-line king," generally well-educated, and more likely to be environmentally aware, as are the key grip and camera operator. The art director decides on sets, and is in charge of the construction crew. Finally, the key grip and the assistant director are responsible for safety on the set.[50] Another key function is that of the location manager, who is responsible for permitting[51] and for handing back the site in the right condition, something that some location managers do better than others.[52]

At the studios, the environmental managers play a major role. Individuals such as Shelley Billik at Warner Bros. and Gretchen Lewotsky at Twentieth Century Fox, as well as their counterparts at other studios, have put in place a wide range of environmental initiatives. Billik's division is in fact deliberately named "environmental initiatives." In her words, "It's the right word for what we do. Our good environmental practices are self-starting, and they derive from our sense of corporate responsibility, not from reaction to activist or regulatory pressures. It's the right thing to do, for the Earth, for our business and for our people."[53]

The studios share information about their environmental practices freely with each other, and the environmental managers meet regularly. At most studios, the environmental

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[42] Source: interview.
[43] Source: interview.
[44] Source: interview.
[45] Source: interview.
[46] Source: interview.
[47] Source: interview.
[48] Source: interview.
[49] Source: interview.
[50] Source: interview.
[51] Source: interview.
[52] Source: interview.
[53] Shelley Billik, VP of environmental initiatives for Warner Bros. Studios, as quoted in David Tereshchuk, "At Warner Bros., environmentalism plays a leading role," *AOL Time Warner Keywords Magazine*, April 2003, page 7. http://mainegov-images.informe.org/governor/baldacci/news/events/docs/KW200304_April_2003.pdf, last accessed April 27, 2005.

department is very small, sometimes consisting of a single person who is also responsible for a wider range of government affairs. At least one of the studio environmental managers meets with each production crew during pre-production, to discuss recycling on the stage, donating sets after use, how to plan for deconstruction rather than trashing of sets, etc. From that point on, it depends on the crew whether they care.[54]

An additional challenge is that the studios do not make money operating sound stages, and they generally prefer to rent space from another studio if it is cheaper than using their own.[55] As a result, studios have limited ability to encourage environmental behavior by the production crews on the sound stages, as a studio that is perceived as being too difficult to work with will not be able to rent out their sound stages.

There is a wide range of other organizations, private and public, affiliated with the motion picture and television industry. The guilds, such as the Producers Guild of America (PGA), the Directors Guild of America (DGA), the Screen Actors Guild (SAG) and the Screenwriters Guild of America (SGA) are among the most influential of the guilds. Many of the below-the-line functions are represented by guilds or unions, such as the Location Managers Guild of America (LMGA), the International Alliance of Theatrical Stage Employees (IATSE) with many Locals representing specific functions. The California Film Commission and its regional subsidiaries facilitate filming on locations within California.

The Entertainment Industry Development Corporation (EIDC) focuses specifically on attracting the entertainment industry to Los Angeles. The Environmental Media Association (EMA) and Earth Communications Office (ECO) are associations of individuals within the industry aiming to promote environmental awareness inside and outside the industry. And, of course, there are several educational institutions aimed specifically at the motion picture and television industry, including the UCLA School of Theatre, Film and Television, the UCLA Extension Entertainment Studies program, and the USC School of Cinema-Television. There are many other relevant organizations, beyond those listed here.

These associations play an important role in education and training within the industry. Much of the training is indeed by internal organizations, such as the guilds.[56] Hence, achieving behavior change in the industry requires changing the training programs in place within the industry. Behavior change in television is easier to achieve, as studio mandates are easier to implement there than they are in film.[57] Later in this report, we discuss training in more detail, in the context of the Safety Passport program.

The Budget

A theme that recurred throughout the interviews was expressed by one respondent as follows: “The variables of production in the motion picture industry are corporate and creative, but the corporate outweighs the creative. It’s all about making budgets not movies.”[58]

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[54] Source: interview.
[55] Source: interview.
[56] Source: interview.
[57] Source: interview.
[58] Source: interview.

Within the studio system, there are three typical scenarios for funding movies. Some are 100 percent funded by the studio; others are co-productions, sometimes "single pot" where production costs are split 50-50 with another distributor; some are "split" where one distributor has the rights to the domestic market, another has the rights to foreign markets; and some are funded through sale of rights, where a single producer/distributor sells the distribution rights for individual territories.[59]

At least one studio controls waste by never approving the first proposed budget, this is our "major means of control over waste versus efficiency in a production."[60] Most budgets include a 10 percent contingency to cover unforeseen expenses, but production companies anticipate that, so there is always some manipulating of numbers going on.[61] The 10 percent contingency is always spent, there is never a bonus (in practice) for completing a project under budget, and setting a higher contingency is also not desirable, as "then you look like you don't know what you're doing and you're a bad producer. The best thing is to spend right up to the budget."[62]

A typical breakdown of a $50 million film budget would include $5-10M for an A-list director, $15M for an A-list actor and appropriate cast, and $2.5M for an A-list producer. The remaining $22.5-27.5M becomes the physical production budget, or the below-the-line part.[63] If the budget needs to be cut, the producer will first start cutting shoot days, which cost about $150,000 per day for actors, crew, catering, vehicles, etc. This means removing pages from the script. Another option is to remove stunt sequences.[64] Even if better environmental practices (such as energy conservation) lead to cost savings, those savings might have to be as high as $100-200,000 for a larger production to actually change its behavior.[65]

Transportation is the second largest line item in a television budget (after talent), e.g., $30,000 per day in Los Angeles for one particular show.[66] The 30-mile zone is a key concept here: "centered at the old offices of the Association of Motion Pictures and Television Producers office at Beverly Boulevard and La Cienega Boulevard" in Los Angeles, it "defines a line past which union members of the Screen Actors Guild and the International Theater and Stage Employees must be paid per diem benefits" (Lukinbeal 1998, page 71).

The result is that this 30-mile radius "represents the most heavily filmed area in the world (Counter 1997), accounting for roughly 75 percent of all motion picture production and filming (Mosher 1997)" (Lukinbeal 1998, page 71). The decision whether to shoot in Los Angeles or not is typically a trade-off between reducing costs (below-the-line) by moving elsewhere and the superior infrastructure available in Los Angeles. For that reason, made-for-movies are usually shot outside Los Angeles, while series, which depend more heavily on availability of permanent infrastructure, are usually shot in Los Angeles.[67]

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[59] Source: interview.
[60] Source: interview.
[61] Source: interview.
[62] Source: interview.
[63] Source: interview.
[64] Source: interview.
[65] Source: interview.
[66] Source: interview.
[67] Source: interview.

The production designer's part of the budget will typically be approximately 65-70 percent labor and 35-30 percent material.[68]

Recycling

At the Studios

At the studios, a considerable degree of recycling is in place. James (2000) describes this in detail, in a report produced for the Solid Waste Task Force, itself formed by the studios in "an effort to ensure that the industry contributes to the City's compliance with the Integrated Waste Management Act, (IWMA) requirements of 50 percent diversion." Table 1 in James (2000) shows that, in 1999, 28,090 tons were diverted out of 46,007 tons generated, a diversion rate of 61 percent. Table 2 in James (2000) shows that the four Los Angeles-based studios even achieved a 69.7 percent diversion rate in 1999. Twentieth Century Fox averaged over 80 percent during the four preceding years (James, 2000, page 5). Warner Bros. has received several awards for recycling.[69]

The AMPTP/MPAA Solid Waste Task Force has collected and published the solid waste diversion rates for the major studios from 1990 to 2004; the trend is shown in Figure 1 below.[70] The Solid Waste Task Force includes Fox Studios, The Walt Disney Company, Paramount Pictures, Sony Pictures Entertainment, Universal Studios, Warner Bros. Entertainment Inc., Metro-Goldwyn-Mayer Studios Inc., and the West Coast broadcast and production centers of ABC and CBS.[71]

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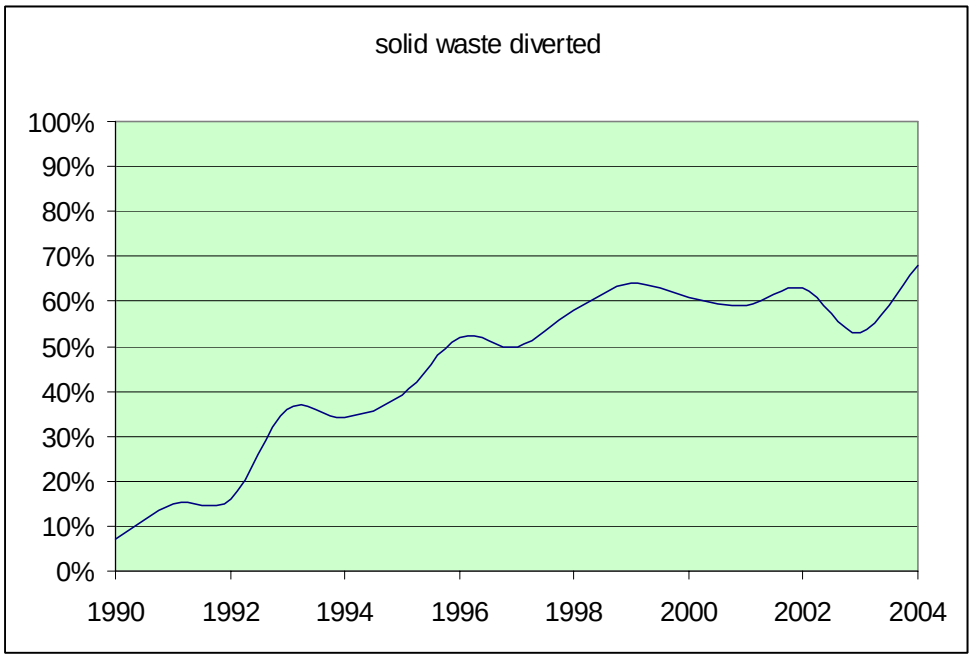
[68] Source: interview.

[69] Nancy Croft Baker, "Warner Bros.: Loony about waste reduction," *Environmental Management Today*, July-August 1996, Volume 7, Number 3, page 9.

[70] Data from the AMPTP/MPAA Solid Waste Task Force, through Sarah Walsh, Legislative Affairs Coordinator, Motion Picture Association of America. Sarah Walsh adds that these percentages can vary greatly from year to year for various reasons, including type of productions and studio-specific issues. The data are provided to the studios by the trash haulers which may introduce further inaccuracies.

[71] From "ENTERTAINMENT INDUSTRY SAYS "CUT!" TO PRODUCTION WASTE: Solid Waste Task Force Reports Total Recycling Rate of Over 68 percent," MPAA Press Release, April 21, 2005. That press release also explains that "The Solid Waste Task Force" (SWTF), comprised of the major studios and television networks, was formed in the early 1990's, following the passage of the IWMA, to address resource conservation and reduce solid waste being sent to landfills. The SWTF Member Companies voluntarily implement waste diversion programs to reduce the environmental impact of solid waste, as well as assist local government in meeting the mandates of the IWMA. Today, SWTF members meet regularly to collaborate on creating additional progressive environmental programs."

Figure 1: Solid waste diverted by major studios in Los Angeles area



Source: AMPTP / MPAA Solid Waste Task Force

Paper

Paper consumption is a highly visible aspect of the motion picture industry. For instance, in 1993, Sony Pictures consumed 103 million sheets of paper, with scripts forming the largest portion of paper waste. Many copies of a revised script are distributed every day, often discarded unread, but by rethinking the distribution system, Sony reduced duplicates and unnecessary copies.[72] Several respondents indicated that recycling was common.[73]

Electronic distribution of scripts is still in its infancy. One success story is that of *According to Jim*, discussed in more detail in the section "Environmental best practices: Case studies." An executive with 30 projects in production has moved towards electronic distribution of scripts, where individuals are notified by email when something is posted instead of distributing the paper script to everyone.[74] This saves the company money, without affecting the sense of power that many individuals in the industry feel in connection with receiving an updated script every day even if they do not actually need it.

Film

Film stock is frequently recycled. Fim Processing Corp., now a subsidiary of Eastman Kodak, recycles film stock, either into new plastic film base or for use as fuel.[75] FPC annually recycles more than 10 million pounds of film stock, of the 35 million pounds

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[72] "It's a Wrap: Hollywood Studio Spotlights Waste Reduction," *EPA Reusable News*, Summer/Fall 1995, pages 6-7. http://www.epa.gov/epaoswer/non-hw/recycle/reuse/rnf5pdf.pdf, last accessed April 27, 2005.
[73] Sources: interviews.
[74] Source: interview.
[75] "Film Recycling Gets Reel," *EPA Reusable News*, Summer/Fall 1995, page 6. http://www.epa.gov/epaoswer/non-hw/recycle/reuse/rnf5pdf.pdf, last accessed April 27, 2005.

created annually.[76] Kodak does not charge for this recycling service, considering it part of the company's zero-landfill policy.[77] FPC, under the leadership of Barry M. Stultz and Milton Jan Friedman, was awarded an Award of Commendation by the Academy of Motion Picture Arts and Sciences on March 4, 2000, in recognition of their pioneering role in film recycling.[78] One major factor underlying the studios' cooperation in film recycling and hence of FPC's business success lies in the anti-piracy value of properly recycling old film stock, not just the environmental benefits.[79]

Some efforts are in place to reuse film, or to reduce consumption altogether. Sony Pictures launched a program to reuse trailers, the film previews shown before the main feature in a movie theatre. Theatres can send trailers to National Screen Service, which in turn will distribute these trailers to discount and second-run theatres to be reused. Only trailers which are too worn out are sent to FPC for recycling.[80]

At least one major studio requires use of digital technology for 90-95 percent of all film projects, as they are easier to distribute than the traditional "dailies" and easier to archive, hence drastically reducing the amount of film stock consumed in the first place.[81]

Sets

Set recycling remains a challenge. It is usually cheaper for the art department to throw sets away rather than dismantle and reuse them,[82] and indeed, most projects do not recycle sets because it's easier and more cost-effective to simply throw them away.[83] When filming in the studio, there is a slight incentive to be sustainable, as it is cheaper to haul away clean wood than mixed trash; however, the cost savings is very small compared to the cost of a movie, and it depends on the specific crew (construction coordinator) whether they make use of this potential cost saving.[84] (Recall the comment reported earlier from a studio executive that it would take $100-200,000 in cost savings for a larger production to change its behavior.[85])

Each shot is its own project, and although the overall construction is carefully planned, the rough carpentry needed for each specific set is not, and once a shot is complete, the lumber is usually not kept for the next shot. Only some materials, such as apple boxes which are used to raise actors, act as steps, etc., are reused.[86] Some sets are stored for integrity. During filming, the "walls" pass from one department to another: they belong to the construction department until the camera starts running, then they belong to the grips for the duration of the shoot, after which they become part of the film, meaning that

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[76] *Purchasing.com*, January 15, 1998; http://www.manufacturing.net/pur/article/CA109704; last accessed June 21, 2004.
[77] Harry Heuer, director of health, safety and the environment for professional motion imaging; quoted in *Purchasing.com*, January 15, 1998; http://www.manufacturing.net/pur/article/CA109704; last accessed June 21, 2004.
[78] http://www.oscars.org/press/pressreleases/2000/00.01.10.html; last accessed June 21, 2004.
[79] Source: interview.
[80] "Film Recycling Gets Reel," *EPA Reusable News*, Summer/Fall 1995, page 6.
http://www.epa.gov/epaoswer/non-hw/recycle/reuse/rnf5pdf.pdf, last accessed April 27, 2005.
[81] Source: interview.
[82] Source: interview.
[83] Source: interview.
[84] Source: interview.
[85] Source: interview.
[86] Source: interview.

the integrity of the item is important in case the scene needs to be re-shot later. They are carefully stored for this possible later reuse.[87]

Some studios have been successful in internally reusing set materials used on-site. For instance, Warner's television programs reuse each other's sets while structural materials from films are reused in the company's own buildings.[88] The Disney website also refers to storage of used sets and other materials, available for rental.[89]

For materials that cannot be reused internally, some other programs exist to reuse set materials elsewhere. The CIWMB manages the California Materials Exchange (CalMAX), a free service for organizations to buy and sell used materials that would otherwise have been discarded. Recycling firms such as LooneyBins (see below) use CalMAX to help find users for leftover set materials.[90] The ReUse People[91] disassembles entire sets in order to salvage building materials for resale; see the section "Environmental best practices: Case studies" for a more detailed description. L.A. SHARES takes donations of reusable materials from the business community, including most if not all studios, and redistributes these items free of charge to non-profit organizations and schools.[92]

Warner Brothers and Twentieth Century Fox collaborated to construct a database of over 750 non-profit organizations (including L.A. SHARES) that could benefit from discarded materials, in a program called Second Time Around.[93] For instance, parts of the sets from *Ocean's 11* were donated to the new Natural Resources Defense Council headquarters building and other organizations.[94,95] Similarly, the staircase in the Southern California Gas Company's Energy Resource Center was salvaged from the set of the Warner Bros. movie *Disclosure*.[96] Many items are sold through eBay.com, which can also be a source of materials; for instance, the Ferris Wheel used in *Lords of Dogtown* was bought through eBay.[97] According to Ted Reiff, President of The ReUse People, markets do exist for

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[87] Source: interview.
[88] Nancy Croft Baker, "Warner Bros.: Loony about waste reduction," *Environmental Management Today*, July-August 1996, Volume 7, Number 3, page 9.
[89] See http://studioservices.go.com/production/backlot_services.html and http://studioservices.go.com/production/history_and_news.html, last accessed July 4, 2005.
[90] http://www.ciwmb.ca.gov/CalMAX/Connection/1998/Fall.htm, last accessed May 22, 2005.
[91] http://www.thereusepeople.org, last accessed April 27, 2005.
[92] http://www.lashares.org/, last accessed April 27, 2005.
[93] Nancy Croft Baker, "Warner Bros.: Loony about waste reduction," *Environmental Management Today*, July-August 1996, Volume 7, Number 3, page 9.
[94] David Tereshchuk, "At Warner Bros., environmentalism plays a leading role," *AOL Time Warner Keywords Magazine*, April 2003, page 7. http://mainegov-images.informe.org/governor/baldacci/news/events/docs/KW200304_April_2003.pdf, last accessed April 27, 2005.
[95] Kristy Chew of CIWMB notes, based on conversations with NRDC staff, that the *Ocean's 11* sets were too big for them to use and were donated to other organizations; e.g., the Watts Labor Community Action Committee received lighting equipment, ceiling panels, lobby furniture, computer racks, cable conduit. The NRDC in Santa Monica did receive sofas from Warner Bros., although they were not used in *Ocean's 11*. From the *Ocean's 11* set, the NRDC building has some fluorescent lighting.
[96] CIWMB Publication #422-96-043, October 1996, available at www.ciwmb.ca.gov/Publications/GreenBuilding/42296043.doc, last accessed May 22, 2005.
[97] Source: interview.

many materials, sometimes locally, sometimes in Mexico or further; the key challenge lies in minimizing costs involved in handling and distribution.[98]

Sets that are no longer needed can be recycled by LooneyBins, a waste-hauling company that sorts and recycles construction and demolition debris, achieving over 70 percent landfill diversion rates.[99] LooneyBins recently received a $2 million low-interest-rate loan from the California Integrated Waste Management Board to help it expand its recycling operations in Los Angeles.[100] Although LooneyBins does not operate in other countries, set building contractors in some other countries do reuse materials as it is profitable there; for instance, when labor is cheap, it can be economically viable to remove nails from wood in order to reuse it.[101] Some materials, such as metal, can be sold after use; the art director's budget sometimes receives those funds, which can be used to cover other expenses within the art department, rather than be returned to the overall production budget.[102]

Used Oil and Re-Refined Oil, and Waste Tire Management

Although tires are not a large portion of the waste stream for the motion picture industry, they are certainly a special waste category that deserves attention given the number of vehicles needed to support the industry. The interviews did not reveal any significant tire management programs that could be highlighted as best management case studies. However, the macro-level environmental impact estimates earlier in this report do suggest that the motion picture industry is a major user of tires: within the Los Angeles area, it is the largest of the five sectors we considered, and a close second across California.

With respect to usage of lubricating oil, the motion picture industry is the largest of the five sectors we considered within the Los Angeles area, (though likely far behind the petroleum refining industry, for which we did not have regional information). Warner Bros. has switched their entire fleet of vehicles from virgin lubricating oil to re-refined oil; this is described in more detail as an example of an environmental best practice later in this report.

One possible role for the motion picture industry lies in educating the public about the value of using RAC (rubberized asphalt concrete) in new road construction. RAC constitutes a high-value use of scrap tires (certainly far higher than incineration in cement kilns), but currently, many decision-makers are not aware of the cost and noise-abatement benefits of using RAC. If the motion picture industry can help to increase public awareness of the benefits of RAC that, in turn, may help legislation get passed which would mandate using RAC when conditions are appropriate. The motion picture industry could take a leadership role by using RAC in all road construction and resurfacing on studio lots; encouraging cities to use RAC in the neighborhood of studios would also help reduce tire noise from penetrating studios during filming.

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[98] Telephone conversation, January 3, 2005.
[99] See under "recycling" at http://www.looneybins.com/, last accessed April 27, 2005.
[100] http://www.ciwmb.ca.gov/Pressroom/2004/March/11.htm, last accessed April 27, 2005.
[101] Source: interview.
[102] Source: interview.

Filming on Location

Protecting and Restoring the Location

Several of the interviewees clearly expressed the opinion that the motion picture industry is a "guest in other communities" when filming on location, and hence needs to take extreme care to leave the location in as good or better condition as before filming. This involves working with local authorities for permitting, hiring local suppliers for catering, construction, laundry, and other services, and ensuring appropriate disposal of paints and other waste, etc. Sometimes, a production company will find that a historical building they plan to use contains asbestos, in which case the production company pays to have the asbestos professionally removed.[103]

With production crews now often well over 100 people, filming on location is comparable to moving an army. In one instance, this involved bringing into an otherwise uninhabited site a collection of 10-ton trucks, cranes, helicopters, jeeps, forklifts, offroad vehicles, golf carts, and material such as pipe and steel used to stabilize other equipment. The dolly grip we spoke with controlled a camera crane with 5,000 pounds of lead to counterbalance a 60 foot arm.[104] To prepare for this army's arrival, the production may have to pave roads and prepare support services, such as restrooms, holding areas, meet other special needs that various departments may have, get the props ready, and prepare for craft services to offer catering and trash collection.[105]

A crew that size does not tread lightly, and while they often take care to avoid damage, things do get torn out and left behind, and the location department is responsible for paying people to clean up after the production leaves the location.[106] In particularly delicate locations, they will try to walk or airlift equipment in, and otherwise protect the location; production meetings will be held to discuss how to protect the location before the actual shoot starts. To illustrate the sensitivity displayed to environmental concerns, one interviewee gave the example of a film which required sinking an airplane. The airplane was in fact put on piles, to avoid disturbing the ocean floor.[107]

A further challenge is the amount of downtime on any location. While the directors and actors are working out the physical aspects of any scene, everyone else waits around, where especially the crew that is lower in the hierarchy (and hence do not have their own trailers) may carelessly tramp around the location.[108]

As noted earlier, the location manager is responsible for permitting[109] and for handing back the site in the right condition, something that some location managers do better than others.[110] A location manager has to think about the environmental impacts of the production on location, and hence is always concerned about what materials the special effects department is using, what chemicals the wardrobe department is using to age clothing, and how to ensure that nothing goes down the storm drains.[111]

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[103] Source: interview.
[104] Source: interview.
[105] Source: interview.
[106] Source: interview.
[107] Source: interview.
[108] Source: interview.
[109] Source: interview.
[110] Source: interview.
[111] Source: interview.

Cities with extensive environmental programs also do have an impact on the practices employed at productions filmed within their boundaries.[112] A major challenge for any production is simply knowing who to call for information, whether about waste removal, air quality issues (for instance resulting from special effects), federal wetlands, etc.[113] This information is different for every location, adding to the challenge of adopting environmental practices while filming on location as compared to implementing environmental practices at a studio. An experienced location manager has all this information, but they are rare.[114]

Energy on Location

Filming on location frequently requires more energy than is available, even when filming in an urban setting, due to the high energy consumption of the lighting required. Diesel generators are commonly used, despite their environmental drawbacks and the immediate noise and smell; a key advantage of generators powered by diesel rather than natural gas is the fact that they can be refueled while running, hence saving precious minutes of time during filming.[115] Debbie Levin of the Environmental Media Association points out the health risks associated with diesel generators, and argues in favor of using the Ultra Low Sulfur Diesel developed by BP and sold as ECD-1 (for Emission Control Diesel) at Arco stations; this would reduce particulate emissions by 10 percent if used without a filter, and by 90 percent if used with a catalyzed particulate filter.[116]

Recycling on Location

In contrast to the relative success of recycling at the major studios, there are few or no recycling services catering to independent productions or to productions filming on location.117 Recycling costs money as it requires two dumpsters rather than one.118 For beverage containers, Hollywood Recycles is a free service for film and television productions filming within the Los Angeles area but away from major studio lots.119 This program is funded by grants, which need to be renewed each season.120 Organizations such as L.A. SHARES, LooneyBins and The ReUse People all work with materials from locations, not just on-site at studios. Once a production leaves the confines of the studio complex, the logistics of reuse and recycling become more complex, and the volumes at any given location become much smaller, posing significant economic and organizational challenges for recycling on location.

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[112] Source: interview.
[113] Source: interview.
[114] Source: interview.
[115] Source: interview.
[116] Debbie Levin, "Ultra Low Sulfur Diesel Is Really Here So Where Do I Get It?" *Green Light: News from the Environmental Media Association*, Summer 2003, page 1. Available at http://www.ema-online.org/_pdf/2003_summer.pdf; last accessed on April 27, 2005.
[117] Source: interview.
[118] Source: interview.
[119] For program goals and a list of current and past participants, see http://www.eidc.com/epg/Hollywood_Recyles/hollywood_recyles.html; last accessed on April 25, 2005.
[120] Source: interview.

Energy Consumption

Buildings

The Sony Thalberg Annex office building consumes 50 percent less energy through a range of energy-conservation measures such as natural lighting, occupancy sensors, efficient lighting and reflective roof coating.[121] Warner Bros. has installed energy-efficient lights on the catwalks in 32 soundstages, among a collection of 23 energy-saving initiatives implemented at a cost of $150,000 and which are now saving over $500,000 a year in energy costs.[122] Warner Bros. applied the new LEED Standard for Commercial Interiors in remodeling their Television Distribution Building 151, leading to an energy load of only 1.2 watts per square foot, 35 percent below the national average for office buildings.[123] That these initiatives are not new is illustrated by the following memo from Jack Warner:

[121] Diane Wintroub Calmenson, "Healing the Environment with Bricks and Bytes: John Picard's vision of the future of design and architecture," *ISDesigNet*, October 1995, at http://www.isdesignet.com/Magazine/Oct'95/Cover.html, last accessed April 27, 2005.
[122] David Tereshchuk, "At Warner Bros., environmentalism plays a leading role," *AOL Time Warner Keywords Magazine*, April 2003, page 7. http://mainegov-images.informe.org/governor/baldacci/news/events/docs/KW200304_April_2003.pdf, last accessed April 27, 2005.
[123] http://wbenvironmental.warnerbros.com/wb_enviro_1_9_9.swf, last accessed on April 27, 2005.

March 23rd, 1955

To: E. de Patie – T.C. Wright – E. Stacey
B. Matthews

There should be an immediate complete checkup on lights being turned off throughout the entire plant when they are not necessary.

About 5.30 last night the basement of the Dining Room was lit up and no one was there. The George Stevens' bungalow was completely illuminated as late as 8:00 last night but no one made any effort to turn the lights off.

This must be happening on the stages, in the laboratory and everywhere else on the set. It is not necessary for us to be spending money for lights and power when they are not being used.

See to it that instructions are issued to turn off all lights when they are not being used. You know what I mean as I have been telling you this for twenty years but somehow or other, it just doesn't seem to happen.

Jack Warner

Dated but not read

Museum legend:
Inter-Office Memo from Jack L. Warner advising employees to turn out lights

Source: seen at the Warner Museum in Burbank, August 18, 2003.

Generally crews do not think much about energy conservation. Gaffers[124] will turn off lights that are not needed if they are using their own lights, as the lightbulbs are expensive; when using studio equipment, less care is given to saving lightbulbs and hence energy.[125] Energy use on a soundstage is considerable; a typical charge is $500-1000 per

[124] Singleton (1996, page 426) defines the gaffer as "the chief electrician on the set who is responsible for the lighting of the set according to the instructions of the director of photography."
[125] Source: interview.

day.[126] A major reason why such large, powerful lights are needed is because larger lights positioned further away from the set allow a larger part of the set to be correctly exposed, as illustrated in Jones (2003, page 327). For an extreme example of lighting needs, consider *The Terminal*, where a track of 100,000 watt lights was used to mimic sunlight streaming through the windows.[127]

Vehicles

Most trucks in the studio fleets run on diesel.[128] Switching to alternative, less polluting or non-fossil based fuels is complicated, as many trucks do not travel far enough to economically justify converting the vehicles to cleaner fuels. And occasionally the trucks travel far enough to exceed the range of electric vehicles.[129]

Various Other Environmental Issues

The paint industry has responded to environmental pressures and most paints used in the motion picture industry today are increasingly low-VOC and water-based.[130] Several studios have programs for collecting unused paint, either donating it to employees or using it as slop paint for basic coating of new sets. One studio mentioned that they have a national vendor for hazardous waste disposal; although this costs more, there is a single phone number that any production associated with this studio can call to avoid any hazardous waste (including paint) from being illegally disposed of.[131]

A frequently recurring issue is the use of lauan, harvested from tropical rainforests, in set construction. The environmental implications of using lauan include tropical forest destruction which in turn threatens indigenous cultures and habitats and contributes to global warming.[132] The Environmental Media Association has an initiative to reduce the amount of lauan that is used for set construction,[133] including providing information (jointly with Rainforest Relief) on alternatives to lauan. Others, though, despite their best efforts, find the substitutes inadequate, as one can make lauan look like anything else, to a degree that has not yet proven possible with other materials.[134]

Other Barriers to Environmental Practices in the Motion Picture Industry

The above summary of the interview findings already points to a series of barriers to adoption of environmental practices, such as the relentless budget pressure. A few additional obstacles that do not fit neatly within the categories discussed above are listed here.

Lack of environmental knowledge is a problem, even among individuals who are environmentally conscious and would like to do the right thing. One producer found that

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[126] Source: interview.
[127] http://www.dreamworksfansite.com/terminal/themakingof_page_three.php, last accessed April 27, 2005.
[128] Source: interview.
[129] Source: interview.
[130] Sources: interviews.
[131] Source: interview.
[132] See http://www.rainforestrelief.org/Campaigns/Safe_Sets_.html, last accessed July 4, 2005.
[133] See http://www.ema-online.org/lauan_reduction.htm, last accessed July 4, 2005.
[134] Source: interview.

the choices are not obvious: for instance, is it best to build a set out of concrete or plastic?[135]

Another issue is the gradual disappearance of the seniority system among crew. As a result, crew members are more afraid to speak up if they see a safety issue, as they can more easily lose their job to a newcomer than was the case in the past.[136] Presumably, the same reluctance carries over to environmental risks too. As discussed later in this report, the Contract Services Administration Trust Fund (CSATF) was created as a partnership between the Alliance of Motion Picture & Television Producers (AMPTP) and the unions, in response to the increasingly entrepreneurial structure of the motion picture industry, as it moved away from the old studio system. This partnership agreement heightens awareness and allows crew members to anonymously report safety concerns.[137]

The time pressure and chaos characteristic of many productions is another major obstacle. An excellent description is provided by Coget (2004, pages 56-57):

> "For the readers who have never set foot on a movie set, it is important to give a quick flavor of what it looks like. The first time one sets foot on a movie set can be daunting. Trucks full of equipment are scattered around in no apparent order. Crew members are hanging out everywhere, fiddling with strange equipment, talking on walkie-talkies, marching in different directions, talking with other crew members in cryptic terms, or just waiting. It's impossible not to get a sense of chaos looking at how these people work. One really wonders how they can coordinate their activity amidst such complexity. Yet, everybody seems to know what they are doing and seems at least minimally mindful of what others are doing. At given moments, such as when the AD shouts, "Quiet please! Rolling," followed by the director's quintessential "Action!," all conversation stops as each person quietly focuses on their part of the work and watches the action.
>
> The director is the person orchestrating this "chaos," with the help of his/her DP, AD and the key department heads, (The head of Art Department, the Costume Designer, the Set Designer, the Key Grip, in some cases the Special Effects Coordinator, the Stunt Coordinator, etc…). Following a director on set for five minutes quickly reveals an essential dimension of his/her job. At any given moment, the director is coping with a number of issues that need to be addressed. While walking around addressing issues – by observing and talking to his/her crew and cast – the director is bombarded by crucial appearing questions thrown at him/her by crew and cast members. Everybody seems to be fighting for the director's attention. Therefore, it is absolutely essential for directors to filter the stimuli that they gather on their own or that they are fed by their crew members so as to discern, select and prioritize what issues are most important for the shoot."

A consequence of this chaos is that the industry squanders human energy, although the large budgets of some major productions hide the major waste of time and energy and incredible inefficiency.[138] Consistent with this, one interviewee, a costume designer, believes that the biggest waste is caused by fear: directors and producers are paralyzed

[135] Source: interview.
[136] Source: interview.
[137] Source: interview.
[138] Source: interview.

and do not make choices until the last minute. The costume designer often does not receive a cast list or script until the night before, which means they cannot plan or budget properly, which leads to more waste and higher expense.[139] As another interviewee, a line producer, noted, "Things take forever, then, all of a sudden ... we need it tomorrow."[140] That this is not inevitable is shown by his experience with a particular film where the director did 4-6 weeks of rehearsals with the actors, well before the actual filming, and then shot for 10-12 weeks. This meant that each department had enough time to do research based on decisions that were made during rehearsal. As a result, the film came in under budget, despite the apparent expense involved in rehearsing.[141] Singleton (1996, page 86) confirms that rehearsing can save a lot of time during shooting and hence can save a lot of money.

The industry is heavily based on apprenticeship:[142] people learn from role models they work with. This means that new (environmental) practices need to filter down through those role models. The motion picture industry, perhaps more than almost any other, does appear to rely extensively on personal connections. The analysis of how epidemics spread, described by Gladwell (2000) in *The Tipping Point*, applies here too: new practices need to be discovered by innovators, sold by persuasive people, and then spread more widely through individuals with extensive connections.

Gladwell refers to a study initiated by Brett Tjaden of the University of Virginia[143] that determines which Hollywood actors are more connected than others. He cites (page 47-48) the example of John Wayne who made 179 movies, but many were similar to one another, hence involving the same cast; John Wayne only ranks 116th in "connectedness." Rod Steiger, on the other hand, was the best-connected actor, having been involved in almost every kind of film, documentary, television production, etc., imaginable. Attempts to spread environmental practices through the motion picture industry would have to first identify who are the likely innovators, who are the connectors, and who will be able to persuasively sell the environmental practices.

In some instances, practices are adopted immediately as a result of pressure from top talent. For instance, the presence of child care on studio lots is a direct result of a top executive producer threatening to resign unless the studio provided child care on the lot. The studio agreed, after which all other studios followed.[144] Similarly, the series *The X-Files* was initially shot in Vancouver, but as it became more popular and the lead actors therefore became more powerful, the show was moved back to Los Angeles, which allows a significant reduction in travel and hence environmental impact.[145]

There is also a negative effect associated with many top individuals. The opulent lifestyle some of them adopt and display publicly, including arriving at work in Ferraris, has an effect on the psyche of crew working alongside them, who can become more prone to be wasteful too.[146]

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[139] Source: interview.
[140] Source: interview.
[141] Source: interview.
[142] Source: interview.
[143] See http://www.cs.virginia.edu/oracle/ for more on the project; last accessed April 27, 2005.
[144] Source: interview.
[145] Source: interview.
[146] Source: interview.

Conclusions

The interviews reported in this section provide a rich and varied view of the many obstacles, some real, some imagined, facing widespread adoption of environmental practices. Clearly, educating individuals about the environmental choices they have is key, as well as continuing to find and publicize environmental practices that are cost-neutral or even cost-beneficial.

Some environmental opportunities require behavior change within the industry. Most of all, the currently prevailing tendency within the industry is to operate within a stop-go mode, both at a large scale and at a small scale. At the larger scale, very little happens for lengthy periods while a project is in its early stages, but when key agreements with financiers or talent fall into place, it switches into a full-speed-ahead mode when everything needs to happen as fast as possible. At the smaller scale, during production, an entire production crew needs to be present on a set even when most of the time nothing appears to be happening, just to ensure that everything can happen quickly during the critical moments when actual filming occurs. Several of the interviews indicate that more careful planning, of the overall project and of actual shooting, can at least in part reduce the uncertainty and resulting tension, which in turn helps by giving individuals the time to consider and implement more environmental choices.

Environmental Best Practices: Case Studies

Best practice example: Carbon-neutral production at The Day After Tomorrow[147]

Background

Grossing $186 million and with an estimated budget of $125 million, *The Day After Tomorrow* had one of the highest box-office sales of films released in the US in 2004.[148] The film depicts an extreme example of how global warming might cause abrupt climate change, leading to severe weather such as hurricanes and tidal waves. Inspired by his personal commitment to environmental conservation, the film's director and co-writer, Roland Emmerich, sought ways to ensure that the production of *The Day After Tomorrow* would not be inconsistent with the film's message; in particular, he wanted to know how he could prevent the film from contributing to global warming. To this end, Emmerich contracted with Future Forests to assist in making his film carbon neutral.[149]

Offsetting Greenhouse Gas Emissions

Eileen Claussen of the Pew Center for Climate Change states: "Although scientists still argue about how fast and how much the atmosphere will warm, the mainstream scientific community agrees on three key points: the earth is warming; the warming can only be

[147] Original version contributed by Jeannie Olander.
[148] According to www.imdb.com, accessed April 19, 2005.
[149] See http://www.futureforests.com/dayafter/celebritypledges.asp and http://www.futureforests.com/dayafter/details.asp, last accessed June 30, 2005.

explained by the build-up of greenhouse gases in the atmosphere; and that the warming will continue if humans do not reduce emissions."[150]

One of the main greenhouse gases is carbon dioxide (CO_2). Throughout production of any motion picture, CO_2 can be generated by the vehicles and tools used: cars, trucks, limos, generators, air travel, trailers, and various machinery.

Future Forests[151] offsets the CO_2 emissions of companies and individuals, by planting forests to offset a portion of their CO_2 emissions or enough for them to become completely carbon neutral, or by investing in climate-friendly technology.[152] Future Forests estimates the emissions and the corresponding amount of forest planting (or climate-friendly technology investment) necessary to offset the impact of those emissions. Its staff coordinates the planting as well as the professional care and maintenance of these trees in forest sites throughout the world. "All forests are planted with the support of local authorities or environmental groups including Wildlife Trusts and Community Forests."[153]

Future Forests did the same for the making of *The Day After Tomorrow*, estimating that the production of the film would generate some 10,000 tons of CO_2.[154] For individual citizens in North America, Future Forests estimates that their greenhouse gas emissions are 22.02 tons per year, requiring 30 trees to offset those emissions, for which they charge $504.26.[155] Using these figures, the 10,000 tons of CO_2 emissions generated by *The Day After Tomorrow* would cost $229,000 to offset; several sources mention that the actual expense was $200,000.[156] Larger offsets are usually cheaper (per ton) than smaller ones, so the actual payment made by Emmerich would be a little lower than this figure. Emmerich paid personally for these offsets; it is interesting to note that no mention is made of 20th Century Fox being involved or publicly supporting Emmerich's decision to make this film carbon-neutral.

The Future of Future Forests in the Motion Picture Industry?

Based on the strong focus on cost that emerges from the interviews discussed earlier in this report, it is no surprise that a major studio (whether 20th Century Fox or any other) would not be prepared to pay approximately $200,000, essentially as a donation, to offset greenhouse gas emissions associated with a specific film. That might change, though, if carbon neutrality is presented as a condition when the rights to distribute the film are first sold. That is, once 20th Century Fox or any other studio already owns the rights to a film,

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[150] The Science and Fiction of 'Day After Tomorrow', *Federal lab and non-profit provide Warming 101* http://www.msnbc.msn.com/id/5058474/, MSNBC, updated May 27, 2004; last accessed April 5, 2006.
[151] Since this section was written, Future Forests changed its name to The CarbonNeutral Company; see http://www.carbonneutral.com/pages/Whoweare.asp; last accessed April 5, 2006.
[152] See http://www.futureforests.com/futureforests/index.asp, last accessed June 30, 2005.
[153] http://www.gocarbonneutral.co.uk/aboutus/background.html; last accessed April 5, 2006.
[154] See http://www.futureforests.com/dayafter/details.asp, last accessed June 30, 2005.
[155] See http://www.futureforests.com/acatalog/Future_Forests_Carbon_Neutral__citizen__North_America__9.html , last accessed June 30, 2005.
[156] One source that mentions an amount of $200,000 is see Andrew Callus, "Climate Change Gets a Hollywood Makeover," Reuters News Service, May 12, 2004, at http://www.planetark.com/dailynewsstory.cfm/newsid/25086/story.htm, last accessed June 30, 2005. Another is the "Trivia for The Day After Tomorrow" at http://www.imdb.com/title/tt0319262/trivia, last accessed January 22, 2006.

it is difficult to imagine them incurring expenses related to carbon offsets, but if such expenses are simply part of the costs of acquiring the rights in the first place, they are far more likely to agree. [157] This example illustrates how the power balance between talent and studios changes during the course of any specific project; talent that is in high demand holds significant power prior to the signing of formal contracts, but once their contract is signed, much of that power evaporates.

The hope that top-level talent will increasingly make such demands is bolstered by the list of celebrities (many from the music industry) that have already worked with Future Forests.[158] For instance, the bands The Foo Fighters and Pink Floyd are paying Future Forests to plant trees to offset the greenhouse gas emissions associated with the production, manufacture, and distribution of their albums "One by One"[159] and "Echoes"[160] respectively.

Some might argue that simply purchasing carbon offsets is not the ultimate objective: rather, it is more desirable to reduce greenhouse gas emissions in the first place. One could also view Future Forests as an attempt to harness the collective concern of the disenfranchised by offering the means for companies and consumers to take positive environmental action. As this becomes more of a trend within the entertainment industry, awareness of environmental issues will increase, and, perhaps, inspire an interest in sustainable practices within the broad business base associated with the industry. Such awareness can contribute to essential behavior change that can directly reduce greenhouse gas emissions while establishing an environmental ethic in a highly visible and influential industry. Therefore, the real and longer-term value of services such as Future Forests may lie in their educational benefits and not only in the actual amount of CO_2 that they offset.

An encouraging development is that the more recent release *Syriana* was also made carbon neutral:[161] Warner Brothers and Participant Productions together paid an estimated amount of approximately $24,500[162] to offset 2,040 tons[163] of CO_2 through NativeEnergy,

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[157] One basis for this speculation is the following excerpt from a news release from Centropolis Entertainment, Emmerich's production company, posted under "News" at http://centropolis.com/centrpeophtml.html, last accessed June 30, 2005:

> "Following one of the most competitive battles in years for a project, Twentieth Century Fox is concluding negotiations for the rights to THE DAY AFTER TOMORROW, a big-budget, mega-event epic motion picture co-written (with Jeffrey Nachmanoff) and to be directed by blockbuster filmmaker Roland Emmerich and produced by Mark Gordon (SPEED, SAVING PRIVATE RYAN), who recently signed a deal with Fox.
>
> The pact marks a major coup for Fox, which competed with four other studios for the project. THE DAY AFTER TOMORROW revolves around an abrupt climate change which has cataclysmic consequences for the planet."

[158] See http://www.futureforests.com/halloffame/celebrity.asp, last accessed June 30, 2005.

[159] See http://www.futureforests.com/acatalog/Future_Forests_plant_a_tree__Foo_Fighters__Forest_240.html, last accessed June 30, 2005.

[160] See http://www.gocarbonneutral.co.uk/home/Pink_Floyd/index.html, last accessed June 30, 2005.

[161] See http://www.nativeenergy.com/news.Syriana.html; last accessed January 22, 2006.

[162] Our estimate, based on NativeEnergy's published cost range of $7-35 per ton of CO_2 offset, and average cost of $12 per ton. $12 x 2040 tons (see next footnote) = $24480.

[163] See http://www.calendarlive.com/printedition/calendar/qtakes/cl-et-syriana20jan20,0,1240927.story, last accessed January 22, 2006.

an organization with similar objectives though slightly different approach than Future Forests.

Best Practice Example: Low-Impact Volcanoes

Background

Two 1997 releases, *Volcano* (with an estimated $90M budget and worldwide gross of $120M)[164] and *Dante's Peak* (with an estimated $104M budget and worldwide gross of $169M)[165], revolve around volcano eruptions, the former in Los Angeles, the latter in the small fictitious town of Dante's Peak. Both films relied heavily on special effects. *Volcano* shows lava flowing through Wilshire Boulevard in Los Angeles past well-known landmarks; *Dante's Peak* contains many scenes depicting the actual eruption and resulting rain of ash over the town.

Mitigating Environmental Impacts

While scouting for the film, the location managers realized they would need somebody with extensive knowledge of forest services, Bureau of Land Management regulations, etc. The person who was hired to be the 2nd unit location manager for *Dante's Peak* had previously worked for the US Forest Service in Montana, where he had, among others, been involved in issuing and monitoring filming permits.

Part of the filming took place in Wallace, Idaho. To simulate the effect of ash raining down on the town, the team used tons of shredded newspaper (cellulose) with a fire retardant, covering an area of several acres. This material had been selected by the special effects coordinator; the fire retardant chosen was relatively benign, the same as is used for fighting forest fires. Special effects coordinator Roy Arbogast mentions that the team also considered sawdust, gypsum, flour, and wheat flour, before settling on newspaper.[166]

The production team hired Environmental Restoration Incorporated in Idaho to remove as much of the ash as possible. A team of 30 people were involved in the cleanup, using vacuum cleaners, shovels, etc. Due to the selection of a benign fire retardant, the minimal amount of cellulose left was not harmful. The production team received a letter from the State of Idaho afterwards, thanking them for the good work done to restore the land.[167]

For *Volcano*, the production team also used shredded paper with a (slightly different) fire retardant to simulate the rain of ash, renting the largest paper shredder available from the CIA. This was the result of special effects coordinators Marty Bresin and Clay Pinney studying footage of the Mount St Helens eruption and in order to translate it to a workable and filmable ash. After each night's shoot, the ash was swept away and recycled.[168]

A major challenge in *Volcano* was to film the flow of lava advancing down Wilshire Boulevard. For this purpose, a 7/8th replica of the Wilshire corridor was constructed at the McDonnell Douglas plant in Torrance, at 17.2 acres the largest set ever built at that

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[164] According to www.imdbpro.com, accessed December 28, 2004.
[165] According to www.imdbpro.com, accessed December 28, 2004.
[166] From http://www.geocities.com/Heartland/Plains/1699/dante.html, accessed December 28, 2004; this site quotes www.dantespeak.com which was no longer available at that time.
[167] Source: interview.
[168] *Volcano* Production Notes, www.cinemareview.com, accessed December 28, 2004.

time.[169] That set was burned down and extinguished several times. Some of the scenes were shot on location at the Beverly Center, over a period of five weekends to minimize traffic disruption. Every Friday night, the crew had to prepare the Beverly Center area to make it look as if a volcano had just erupted, covering the trees, the streets, etc., then after filming on Saturday and Sunday, the crew would meticulously clean every leaf of every tree on Sunday night, power washing the streets and plants. Some scenes took place in the "Emergency Management Office," the control center in the film. The actual Emergency Operations Center (EOC) of Los Angeles County was used for this, on the understanding that the film crew would have to evacuate immediately in the event of an emergency. Many off-duty staff of the EOC joined the production as background artists, which would facilitate the transition in case of an emergency.[170]

The Role of the Location Manager

The role of the location manager is crucial in all this: a major production is inevitably a disruptive event, but the extent to which a community looks back favorably or unfavorably on the experience depends in large degree on how well the location manager handles everything. Several of our interviewees clearly consider locations for filming to be a scarce resource, to be treated with great respect, as otherwise the film industry will no longer be welcome. This quote from one of the location managers is typical: "From a location manager's perspective I want to take care of the community."[171]

Best Practice Example: The San Diego Film Commission and "Lords of Dogtown"[172]

Background[173]

The San Diego Film Commission sees itself, first, as an economic development program for San Diego, and second, as a personal liaison between film productions, communities and local government. Our interviewees within the San Diego Film Commission explain that these (related) roles involve a total commitment to promoting positive experiences for film productions and to promoting opportunity, health and safety for communities. The San Diego Film Commission offers "Nordstrom service" and "one stop shopping" to productions and to communities alike.[174]

The San Diego Film Commission coordination of the project *Lords of Dogtown* (estimated budget: $25 million[175]) employed several economic, social and environmental best practices for both the production company and the city of Imperial Beach, CA. Through its existing and growing research of such best management practices, the San Diego Film Commission is accumulating a collection of guidelines for green production, available to location managers, location owners, other film commissions, and anyone interested in best management practices, environmental or otherwise.

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[169] Martin Grove, "Hollywood Report: Lightning Accompanied 'Volcano' to Los Angeles," *The Hollywood Reporter*, April 16, 1997; accessed at www.hollywoodreporter.com on December 28, 2004.
[170] *Volcano* Production Notes, www.cinemareview.com, accessed December 28, 2004.
[171] Source: interview.
[172] Original version contributed by Joanna Hankamer and Jeannie Olander.
[173] Much of the information in this section is obtained from interviews with two members of the San Diego Film Commission.
[174] These terms are apparently used in the "Introduction" prepared by the San Diego Film Commission for the proposal submitted to the *Lords of Dogtown* production company.
[175] See http://pro.imdb.com/title/tt0355702/, last accessed June 30, 2005.

Released in theaters in June 2005, *Lords of Dogtown* chronicles the rise and craft of freestyle skateboarding in Venice in the 1970s. Based on the young skateboarders who created the style, the film takes place in a run-down area nicknamed "Dogtown" near a failed amusement park in Venice, California. The production of *Lords of Dogtown* found a suitable film location in Imperial Beach, California, to portray Dogtown. Due to its aesthetic similarity to Venice and its existing pier and seawall, the Imperial Beach Pier became the location of first choice for the production company. However, due to certain "sensitivities and environmental concerns," and given a proposed set construction to include an extension to the existing pier and a 50-foot high broken Ferris wheel,[176] exceptional coordination was required to secure the location and to permit filming activities.[177]

Understanding that film production is good business for their local communities and likewise that good business practices in film production are required for locations to continue to be available, the San Diego Film Commission's Kathy McCurdy, V.P. and Director of Features, and Kimberly Hale Pudgil, Director of Community Relations, worked closely with the production team, government agencies and the local community to facilitate the film production. Without the research and liaison efforts of the San Diego Film Commission, such a sensitive location would likely have been near impossible to use for filming. Yet, the obstacles that were overcome and the resulting success of the project, for the production as well as for the community, make the *Lords of Dogtown* an appropriate case study.

Kathy McCurdy and Kimberly Hale Pudgil acted as liaisons for the production of *Lords of Dogtown*, including location scouting, neighborhood outreach, coordination of government agencies and adherence to the rules and regulations of several jurisdictions, and production "wrap" and site restoration. Sorting out which organization had jurisdiction over a particular issue was often a challenge in itself. For instance, the agencies and organizations involved included:

- Imperial Beach City Manager's Office
- California Coastal Commission
- U.S. Fish and Wildlife Department
- California Department of Fish and Game
- U.S. Army Corps of Engineers
- U.S. Department of Homeland Security; United States Coast Guard
- County of San Diego
- Port of San Diego
- Mar Vista High School
- WildCoast
- City of Chula Vista

[176] The Ferris wheel was purchased through eBay.com.
[177] "Introduction." Prepared by the San Diego Film Commission for the *Lords of Dogtown* proposal.

- San Diego Harbor Patrol
- NOAA Fisheries
- South County Economic Development Corporation
- United States Navy

Between these agencies, a broad set of environmentally, socially and economically sensitive issues had to be considered. The communities involved included the local community, the tourist community, and the surfer community. The San Diego Film Commission partnered with WildCoast and with surfer communities, including offering assistance with organizing a surfer event. To compensate a community for the 6-8-week invasion by a production company, they often expect a special hosted screening afterwards; the San Diego Film Commission helps to work out such arrangements.

Several endangered species had to be considered (the least tern, the snowy plower, the grunion), while existing plants also had to be preserved. Several sensitive properties were involved: the Tijuana River Estuary, some U.S. Navy property, the mean high tide line, a water pollution and storm water discharge area. The 3Cs of "control, contain, capture" are an integral part of how the San Diego Film Commission deals with such properties. There were restrictions on fill, and graffiti removal had to be arranged. Economic considerations included the local vendors whose jobs could be affected. The revenues caused by the production to local businesses were tracked using "Dogtown dollars"; these revenues were estimated to be $85,000 per week for the 7 weeks of production, including hotels and per diems.

The approach of the San Diego Film Commission revolves around forming partnerships with all appropriate constituencies to ensure best practices are implemented. Due to their commitments to such partnerships, and due to their pre-planning and pre-notification processes, the San Diego Film Commission helps production companies obtain permits faster than might be the case otherwise. For instance, the environmental groups watching the beach keep a close eye on what happens there and sometimes become the de facto regulators in situations where local authorities may not have the expertise or resources to act.

The San Diego Film Commission's efforts to research the snowy plower and the grunion, and to educate the production company about these species, likely contributed to making the film possible. Another example of the value of such partnerships occurred when the level of bacteria on the beach was too high, due to rainfall; the director of environmental services called the San Diego Film Commission to say it was OK to film. The San Diego Film Commission was also able to ask the military to re-route helicopters during filming to reduce noise during filming. All in all, the San Diego Film Commission performs many of the duties traditionally held by location managers and location owners.

The San Diego Film Commission hopes to develop a clearer set of environmental guidelines and processes, to continue to improve the services they offer to production companies and communities.

Best Practice Example: Waste Management at "Film X"[178]

Background

Released in the early 2000s, Film X, a two-hour, dramatic film based on a popular bestselling novel and comprised of a large cast of A-list actors, was intended to reach a broad audience. The anonymous respondents for this case study include above-the-line staff (the director and one writer) as well as below-the-line crew (line producer, costume designer and the film's production designer). Though Film X was not produced with a specific mandate to apply environmental best practices, these crew members described themselves as environmentally conscientious within their personal lives and discussed the ways in which they try to divert the typical waste streams they witness within their departments. The interviews reveal the strategies they try to implement within their departments to reduce waste and energy consumption in a fast-paced work environment where decisions must be made quickly and reactively, while trying to stay within the budget.

Implementing Environmental Practices Within the Motion Picture Industry

When the five interviewees were asked how sustainable and green practices could be applied to film production, the above-the-line crew who worked on this production described the film industry as a "fairly clean industry"[179], while the below-the-line crew expressed concern about the significant amount of waste within the industry and understood that the motion picture industry "inherently has environmental and chemical concerns and issues."[180] Because of the consistent waste the interviewees have witnessed during years of work within the industry, each of them has endeavored to reduce waste and make efforts to reuse materials when possible. Often, the greatest obstacle is cost. Most creative decisions are restricted by considerations of cost and time, but practical, sustainable measures, such as reuse of materials, are not always the fastest and/or the cheapest solutions.

When asked how environmental best practices could best be implemented within film production these interviewees agreed that the production hierarchy within the motion picture industry must become the vehicle for implementing any "green" production strategies, and that, furthermore, it is crucial to first "educate and influence the influential."[181] Each interviewee further recommended that the unions within the industry would be significant resources for helping to educate the "influential" - directors and producers - about green practices and that the DGA and PGA would be the most effective unions to do so.

On location, the line producer or the location manager would be the individuals most likely to implement environmental best practices for a production. "For example, they would be the ones to tell everyone to recycle and then will make sure the P.A.'s

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[178] Original version contributed by Joanna Hankamer and Jeannie Olander. This is not a "case study" in the same sense as the other cases in this section, but is included here as it represents the only occasion that our research team got close to our original intention, which would have involved meetings with a wide range of individuals who participated in the same project, in order to write a full case study report on a limited number of films and TV shows.

[179] Source: interview.

[180] Source: interview.

[181] Source: interview.

(production assistants) set up a place for recycling."[182] The film's director amplified this dynamic: "My perspective as a director is that I am personally interested in waste management and recycling management, however, I am so busy with other issues that I will have to rely on the line producer and the location manager to make my life easier, they come to me to suggest how we're going to solve problems … on location everyone has to think about the environment and that there is concern with impacts on wildlife, the pollution of water, noise pollution, etc. We can become more "green," but it will be up to these two to come up with a way to make it possible and not more difficult." [183]

When asked about any significant trends around environmental best practices within the industry, the costume designer for Film X said that he believed "certain producers actually are aware and care to behave conscientiously about the environment."[184] He described the profound weight and significance a producer's environmental mandate can have on the crew. He explained that a producer he once worked with would make time at the crew meetings to repeatedly ask that people be aware of the environment. "He would say, 'Let's make sure we're aware of our location, that we respect it and leave it the way we found it.' Also, the A.D. (assistant director) typically calls a safety meeting and will review particular issues or aspects of the environment."[185] He explained that each set has a different set of values and culture and that the director and producer greatly determine what they will be.

In a later interview, the line producer was asked how he could implement or manage a "green" production. He replied, "I would need tools and resources … and it would be important to make these readily available and to keep them to the typical standards and expectations … what's most important is to get people to buy into it … it should be the cheapest, most expedient way. Each production sponsors daily meetings with the 1st A.D. (assistant director), production manager, line producer, and the production coordinator in which safety guidelines are explained, then why not a daily environmental meeting? Location managers make sure that the site is handed back in the right condition and make sure the crew is aware of the issues of the site. However, some care and some do not and that's what makes a difference in behavior on the set. Line producers … can enforce a mandate. For example, they can tell craft services to recycle. Lastly, construction managers would be most knowledgeable about reducing waste streams (of tangible items)."[186]

Obstacles and Loopholes

The film's production designer discussed the nature of film production and the inherent obstacles to "green" production. He said, "The variables of production in the motion picture industry are corporate and creative, but the corporate outweighs the creative. It's all about making budgets not movies. The two parts of the business are the corporate structure as well as the independent productions and vendors that are not tied to the corporate structure. There are so many different employers and this makes it difficult to standardize procedures … there are so many people working and so many employers there are no set ways of even how to do a job.

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[182] Source: interview.
[183] Source: interview.
[184] Source: interview.
[185] Source: interview.
[186] Source: interview.

Within the union there is the possibility for training (and a way to contact) all the members to know what are the requirements to evaluate what each job should entail. It is impossible, however, to govern independents (that are not part of a union). It is physically impossible to govern the wide arm of production. (The) corporate structure and all its fingers (can have an influence and a system for implementation); even companies that are primary vendors can be influenced. Within the motion picture industry the signatory is always abiding by all union contracts. The corporate (or studio) creates an LLC (limited liability corporation) to produce a movie. The LLC in a new location doesn't have to follow the CAL OSHA requirements, (it only) has to follow federal (requirements) which are less strict.[187] So, now everyone loses. The LLC also determines the payroll company as the employer. The vast majority of productions (is made up) of freelancers. Those that are making the most environmental impact are the unions."[188]

Waste Streams

Departments that have tangible waste streams are the set design, art, construction, and paint departments. The grip department and catering accumulate a significant amount of trash as well. The costume designer and the line producer shared their observations about waste on the set.

> **Costume Designer:** "Reviewing how waste streams are generated within production and within their departments in particular … the greatest waste stream is caused by fear. Money and choices cause anxiety for directors and producers. They can become paralyzed and so do not make choices until the last moment. If fear is controlled, then one can control waste." The costume designer said that his department is often not given either a cast list or a script until the night before. He explained that this is a compromising situation as he can't plan or budget sufficiently and so more waste and more expense are incurred due to this. "(A) lack of communication about script changes can, also, create this problem."[189]

> **Line Producer:** "I think most everyone is interested in environmentally friendly behavior, but the greatest challenge is to figure out how to make it readily available. Very few people go by the rules. This is because money is the bottom line, it is everything; this is the greatest obstacle to green production. If any suggestion for a green production increases the budget, then it won't work." He noted that "generators have quite an effect on the environment. Otherwise the most common items that are wasted are the paper used for distributing scripts, and the materials that go into a set that gets thrown away. There are times that sets can be re-used or re-configured. Also, a lot of people grab water bottles, drink just a little, then leave the bottle with most of the water to be thrown away. It would be great if there were a viable way to promote carpooling, but everyone has such different call times, it's not a 9-5 job. It would be great if there were a government subsidy for alternative vehicles for use in production."[190]

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[187] We presume the respondent meant that production companies, LLCs, that are incorporated and operate outside California do not need to comply with CAL OSHA regulations.
[188] Source: interview.
[189] Source: interview.
[190] Source: interview.

Precedents

The production designer for Film X shared ways in which he customarily works to reduce waste within his own department. He said, "My aspect of production is the greatest waste stream. Production treads upon 300 environments in a year. I try to leave things better off than when I found them … sometimes the speed does not allow for best practices."[191]

The production designer explained that one way he is able to reduce waste is by salvaging sets. In almost every film production, he does what he can to find ways to salvage a set, whether via storage, sending it to another lot, or donation to a local school or theatre. This is much easier to do when in Los Angeles and not so easy when on location. He explained that there are additional benefits to compensate for the extra effort required to find new use for sets. One benefit is that, "It's cheaper for a school to pick up an old set. Each studio has a different (set) of standards and practices for their disposal of scenery. It often costs more to store sets for reuse than it does to rebuild. ... When I donate the sets to schools, volunteers have to break it down. This can add additional challenges as it creates liability issues when 'volunteers', not part of the production, come onto the set to break it down. Not everything we make can be reused. Sometimes it's cheaper to use an unrecyclable material … (and sometimes) the material you put on the walls makes it harder to reuse a wall (like) wallpaper or stucco."[192] Regardless of the set or the location, however, this production designer has his crew make certain to, at a minimum, "separate organics from inorganics so that there is a clean landfill."[193]

Some of this production designer's goals for a production, in general, are to "impact peoples' lives less, to give people better experiences, and to avoid burning a bridge"[194] for the current production and for future productions. He also makes a habit with homeowners who lease their property as locations to select wallpaper and paint they can live with after the shoot so as to reduce the waste of material, money, and labor.

The film's costume designer shared what he considered to be a good example of a beneficial collaboration between a director, producer, and all other departments. This experience was based on a project he worked on several years ago. Apparently, this film generated "relatively no waste because the director rehearsed the actors far in advance of the filming. He rehearsed the actors 4-6 weeks, then shot 10-12 weeks. Because of these rehearsals, a lot of important decisions were fleshed out well in advance. This meant that there was an appropriate amount of time for each department to do adequate research based on decisions that had been made before the departments started.

This film came in under budget because of the amount of homework the departments were able to accomplish. This is a very good example of a true collaboration. The collaboration makes the machine run. In the end it's a wonderful collaboration. Sometimes bad habits are repeated because people can be afraid of trying something new, (such as, in this example), rehearsing the actors for an unusually long time before the filming. However, this director was experienced and had a good understanding of the

[191] Source: interview.
[192] Source: interview.
[193] Source: interview.
[194] Source: interview.

needs of the many departments that plug into the making of a film. A good line producer will try new approaches too."[195]

Potential Partnerships

During the interview, the director suggested that municipal partnerships could be vital to a production's success in implementing environmental best practices. Cities concerned with the environment have a big effect on the way in which production is managed. Easy and quick access to green infrastructure such as recycling bins, environmental information, etc., can make or break a production's ability to implement environmental guidelines.

"For example, a city could facilitate recycle bins to be brought onto a location … offer craft services a special kind of trash can for recycling. Another example would be the use of slogans and artwork creating a symbol that reminds people and influences them … to see and connect to the idea or concept of green production. An example of this was the use of an advertising campaign to get people to stop littering in the '70s. The messaging was important and had a tremendous effect in behavior modification."[196] Lastly, the director urged that any best practice guidelines for "green production" made for the motion picture industry must not inconvenience the crew. This is essential if best practices are to be implemented.

*Best Practice Example: Reducing Paper Usage at "*According to Jim"

Background

An immediately visible stream of waste associated with motion pictures and especially TV shows is the paper used for scripts. In the case of weekly TV sitcoms, the scripts are frequently updated, before being photocopied and shared among producers, directors, actors and others. As an example, one 2004 TV show, produced by one of the major TV studios, used 251 cases of paper (where each case is 10 reams of 500 sheets), totaling 1,255,000 sheets of paper, between June 7th and December 7th, 2004.[197]

Tablet PCs Replace Paper-Based Scripts

The TV series *According to Jim*, which was first released in 2001, has switched their writing staff from paper to the wireless-enabled Motion M1300 Tablet PCs.

Jeffrey B. Hodes, co-executive producer of the show, says "Last season, we consumed at least 275,000 sheets of paper. There's just no need for this kind of waste. With the M1300, our staff can write their own notes on a digital version of the script and send files instantly. And at the end of a production day, we no longer have to sit around waiting for copies of the rewritten script. The scripts appear instantly on our tablet PCs, saving not only money but time."[198] The financial savings due to the avoided paper purchases have

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[195] Source: interview.
[196] Source: interview.
[197] Email communication to Corbett, December 18, 2004.
[198] See http://www.motioncomputing.com/about/news/press_release_10172003.asp, accessed December 28, 2004.

been estimated at $1500 over 28 episodes.[199] The paper savings amount to 2,750 pounds over 28 episodes.[200]

Winchell describes how this initiative started:

> "He met with Microsoft, Intel and Motion Computing, and convinced them to donate $70,000 worth of tablets, docking stations, keyboards and legally licensed software. Now that the initiative has proven successful, these companies are well positioned for a new market niche. Tablet PCs are ideally suited for scriptwriting, as writers can handwrite on the digital screen and save their notes. By adding the benefit of a wireless network, notes and scripts can be shared immediately with every writer. Even when producers fund the technology out of their own pockets, Hodes says, their investment will be offset by increased productivity. "Every time I get an instantaneous script on my tablet, I save 10 to 20 minutes," he notes."[201]

Though we do not yet have more detailed information on the exact time savings, or on the benefits associated with these time savings (financial savings through shorter work hours, more flexibility in modifying scripts, etc.), the motion picture and TV industry are generally obsessed with saving time, as time is the prime driver of cost.[202]

*Best Practice Example: Kenter Canyon Charter School Library ("*Life as a House" *Lives on in the Kenter Canyon Charter School Library)*[203]

Background

One of the more visually dramatic examples of movie set reuse comes from the Los Angeles Unified School District's new Kenter Canyon Elementary School Library. New Line Cinema released *Life as a House* in 2001. Those that saw the movie saw an attractive 1,100-square foot Craftsman-style house being constructed, and unlike the majority of movie sets which are made from lighter weight and generally less durable materials, much of the structure was made from high quality grade #1 Douglas fir. But, like the majority of movie sets, after the filming was completed, the set was to be demolished and disposed.

Costume Designer / Kenter Canyon Elementary School Parent Envisions Reuse of the Set

The fate of the movie set was altered though when the movie's costume designer and also a parent of a child at the Kenter Canyon Elementary School envisioned reuse of the

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[199] Email communication to Corbett, December 17, 2004. Note that this implies a price of $0.05 per sheet. This is consistent with the price quoted on December 28, 2004, for plain white copy paper at www.officedepot.com, of $24.85 per case of 10 reams of 500 sheets each, when purchasing at least 6 cases.
[200] Standard white copy paper is "20 pounds," meaning that one ream (500 sheets) of the original uncut size of that paper weighs 20 pounds, so each ream is 5 pounds. See http://home.howstuffworks.com/question329.htm, accessed December 28, 2004.
[201] Katie Winchell, "Conscious Business: Conservation According to Jeffrey," *WholeLifeTimes*, April 2005, http://www.wholelifetimes.com/2005/wlt2704/consciousbusiness2704.html, accessed April 17, 2005.
[202] This best practice example also led one of the authors of this report, Corbett, to experiment with a Tablet PC, with similar productivity benefits. All editing of this report was done entirely on the Tablet PC, eliminating the need for printing of intermediate versions.
[203] Original version contributed by Kristy Chew, CIWMB.

structure. She contacted a fellow Kenter Canyon parent who was also an architect, who was impressed by the structure. The architect enlisted the help of another Kenter Canyon parent, an executive with a construction project management company.[204]

The Kenter parents were able to work with New Line Cinema to donate the structure to the Kenter Canyon School. However, for a number of reasons the actual structure could not simply be picked up and moved to the school (e.g., the movie structure was smaller than the needs of the school, and the lumber needed to be re-graded and certified before it could be used in a public school).[205] In the end, approximately 2,000 cubic feet (ft^3) of lumber (e.g., sheathing, beams, and posts) from the 1,100 square foot movie house were reused in the Kenter Canyon School library and 500 ft^3 of lumber were reused in its construction (e.g., concrete forms, window casings etc.).[206] The donated lumber is valued at about $35,000.[207] The school and parents raised the additional funds needed to build the library and acquire the necessities to create the state-of-the-art facility that they desired, such as additional books, computers, and other library materials and to fund a librarian position.

Surprises and Challenges

The school and parent volunteers overcame a number of physical and economic challenges associated with reusing the movie house for the Kenter Canyon School library. Prior to removing the structure from the movie shoot location, the school / volunteers had to provide proof of insurance and bonding. The Kenter parent with the construction project management company provided the insurance and bonding. Due to the movie studio's lease limitations, after the insurance was secured, the parents and volunteers had only three days to dismantle and move the movie house from the ocean-side shooting location.

Another major hurdle in the project was obtaining the permits and approvals from the State's Department of General Services, Division of the State Architect, the entity that reviews plans for public school construction projects to ensure that plans, specifications, and construction comply with California's building codes. In order for the lumber to be used as structural supports at the school, the wood stain that was applied for the movie had to be removed and then the wood had to be re-graded by a certified grader. The lumber salvaged from the movie set provided about half of the lumber used in the new 1,700 square foot library, which was a significant cost savings.

Environmental Benefits

Approximately 2,500 ft^3 or 62.5 tons of lumber were salvaged from the *Life as a House* structure and diverted from the landfill. The reuse of 62.5 tons of dimensional lumber is the equivalent of reducing greenhouse gas emissions by 34 tons (metric tons of carbon equivalent)[208] by eliminating the need for virgin resources. Reusing 62.5 tons of lumber also saved energy, about 213 million BTUs (British thermal units), enough energy to run two average households for one year or 41 barrels of oil.[209]

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[204] Source: interview by Kristy Chew, CIWMB.
[205] Source: interview by Kristy Chew, CIWMB.
[206] Source: interview by Kristy Chew, CIWMB.
[207] Source: email to Kristy Chew, CIWMB, January 13, 2005.
[208] Northeast Recycling Council Environmental Calculator, December 2004.
[209] Northeast Recycling Council Environmental Calculator, December 2004.

Community Benefits

Initially, the beautiful design of the *Life as a House* structure inspired Tippe to imagine its reuse at her child's school. However, having a new library also inspires the students. The existing Kenter Canyon School's library, originally built in 1955, contained about 6,000 books, and was less than 750 square feet in size; too small to adequately hold even one classroom of students. The new library, built in same Craftsman style as the movie house, is 1,700 square feet, holds 11,000 books, and is able to accommodate up to three classrooms at a time. The library is now modern and comfortable -- a real gem to the school's 450 students.

The energy, enthusiasm, and fundraising that went into the new library have allowed the school to have a librarian and provide new and expanded library programs and technology for the students, whereas in many schools, library programs have decreased due to budget cuts. The enthusiasm for learning by the students and the new and expanded programs offered by the library has increased hand in hand. The new library is now hosting "story times," guest authors, book groups, homework clubs, study groups, and special events for the students. In a fitting end, the Kenter Canyon School's new art classroom and art gallery is now housed in the original library, where perhaps one day it will inspire a Kenter Canyon student to design structures as admired as the Craftsman-style that inspired the library.

Lessons Learned

- To make the exchange and reuse of materials easier and to maximize the amount of materials to be reused, the motion picture industry should develop a reuse/salvage plan prior to construction of the movie set. The reuse/salvage plan should specify who is responsible for providing the bonding and insurance in the required amounts.
- When schools or other similar entities seek to reuse materials for structural purposes, permitting agencies, like the Department of General Services, Division of the State Architect, should be contacted early in the project planning phase to ensure that permitting requirements are well understood and can be met.

Best Practice Example: The ReUse People Salvage the Sets From" The Matrix" 2 and 3[210]

Background

The ReUse People (TRP) is a nonprofit organization that started in San Diego in 1993 and began operating in Alameda County in 1999.[211]

The two sequels to *The Matrix*, known as *The Matrix Reloaded* or *The Matrix 2* and *The Matrix Revolutions* or *The Matrix 3* were both released in 2003, by Warner Brothers. After the success of the initial release, the budget for *The Matrix 2* was an estimated $127M, and a worldwide gross of $736M; *The Matrix 3* had a $110M budget and grossed

[210] This section was written with assistance from Ted Reiff, President, The ReUse People, who is the source for much of the information included here.

[211] See http://www.thereusepeople.org/ for more information. See also *Benefits of Regional Recycling Markets: An Alameda County Study*, California Integrated Waste Management Board, 2003, pp. 19-20, accessed at http://www.epa.gov/jtr/docs/ca_98report.pdf on January 5, 2005, for more information on The ReUse People's salvage and retail operations.

$424M worldwide[212]. Parts of both films were shot at three sets and on the streets in Oakland and Alameda Point.[213] The sets were large. For instance, the cave set consisted of 90 tons of material, wood and polystyrene blocks. The tenement set consisted of 300 tons of material, representing 8 building fronts. The freeway set consisted of more than 7,700 tons of concrete, 1,500 tons of structural steel and 1,500 tons of lumber. As a result of a joint project between Warner Brothers, the city of Alameda, the Alameda County Waste Management Authority, and The ReUse People, 97.5 percent of all the set material was recycled.

Recycling the Sets

The ReUse People dismantled the set piece by piece, and handled processing and distribution of the salvaged materials. According to Rockstroh[214]:

- "The lumber was sold to a company that builds housing for low-income families in Mexico. Thirty-seven truckloads went south, and three truckloads went to The ReUse People's yard for resale to the public.
- 100 percent percent of the steel was used as is.
- Some 48 fire escapes were sold to area contractors along with more than 60 decorative moldings.
- The polystyrene blocks were sent out for use in insulation material.
- And 3.9 miles of k-rail from the mystery freeway was broken up, crushed, stored on site and eventually sold off as class 2 base rock."

As of December 15, 2004, the last of the fire escapes were sold at The ReUse People's warehouse.

What makes this achievement all the more remarkable is that the cost to the production company is unlikely to have been significantly higher than it would have been using a more traditional demolition firm, as it is unlikely that The ReUse People would have been selected for the work otherwise. In the Fall of 2001, the California Film Commission awarded Warner Brothers the "Humanitarian Award" for its environmental stewardship.[215]

TRP's work force of 18 people worked 124 days to complete the project. According to the Alameda Waste Management Authority, the 11,000 tons diverted from the landfill represented 10 percent of the total annual solid waste stream for the city of Alameda.

Had a traditional demolition company completed the project instead of TRP, the expanded polystyrene, plywood, oriented strand board and truss joists would all have been landfilled. These materials, due to their composition could not be ground up for ground cover or cogeneration as we do for small pieces of clean lumber.

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[212] According to www.imdbpro.com, accessed on January 5, 2005.
[213] Dennis Rockstroh, *San Jose Mercury News*, December 2, 2001; reproduced at http://www.thereusepeople.org/inside.cfm?p=VelvetCrowbar&recordID=92, accessed on January 5, 2005. Much of the information in this section was obtained from this article.
[214] Rockstroh, cited above.
[215] *In Business*, 24:2, March/April 2002, page 4.

Surprises and Challenges

Ted Reiff adds that the contract with TRP was signed after the filming was finished and TRP did not have the chance to consult with the production people before construction began to suggest ways to improve the time and cost of salvaging. For instance, if standard k-rail had been used or made, there would have been no need to breakup and crush the k-rail that was eventually used. This would have saved over $30,000 and approximately two to three weeks. Throughout this process, TRP's contact was with the production's location manager.

For reasons outside their control, the dismantling of the freeway sets was started by another organization than TRP; TRP reduced its contract price in lieu of this dismantling work. However, the work was performed so poorly, that TRP spent even more time correcting the work once they got on the job. In future contracts, TRP will not allow others to dismantle sets without their supervision and guidance. Other than this slight glitch, TRP's total crew days on the project were only 3 days over its forecast of 121 days.

Best Practice Example: Warner Brothers Implements Re-Refined Oil Program[216]

Background[217]

Warner Bros. Entertainment Inc. operates a motion picture and television production and post-production facility located on 142 acres in Burbank, California. Production facilities include 34 soundstages and a 20-acre backlot. Post-production facilities include eight dubbing stages, the Eastwood Scoring Stage, two automated dialogue replacement stages, a Foley stage, and over 175 editing rooms. Warner Bros. has all of its own municipal services including a fire department, police department, parks department, sanitation, transportation, plumbing and electrical. Warner Bros. is a broad-based entertainment company involved in every aspect of the entertainment industry, from feature films to television, home video/DVD, animation, comic books, product and brand licensing, interactive services and international cinemas. They employ thousands of people in a broad range of fields, including office work, fabrication, construction and production, and are literally a "city within a city."

Environmental Programs at Warner Bros.

Warner Bros. has implemented numerous environmental programs such as their environmental purchasing program, a sustainable design and construction policy, an energy conservation program and a green building philosophy. They are committed to conserving resources, reducing waste through reuse, donations, recycling, energy efficiency, and educational programs that benefit the economy and assist the local community. In the last 12 years, Warner Bros. has increased their waste diversion rate from 7 percent to 53 percent, recycling and donating 2,983 tons of materials in 2003 alone. Annually, Warner Bros. saves $150,000 in disposal costs, generates $25,000 in

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[216] Original version contributed by Brenda Smyth, CIWMB, based on public information on file at CIWMB, including the California Integrated Waste Management Board WRAP applications from Warner Bros., 1993-2004.

[217] The background information about Warner Bros. was collected from http://www.wbjobs.com/?fromnav=movies, last accessed July 3, 2005.

revenue from recyclables sales, and has reduced energy consumption by over 6 million kilowatt-hours or $760,000.

Another example of a sustainable program that Warner Bros. has implemented is their energy efficiency program. Warner Bros. upgraded HVAC equipment, installed more occupancy sensors and thermostat setbacks, and reduced lighting. They replaced incandescent light bulbs with compact fluorescent bulbs. Light bulbs were switched out on the catwalks of all 34 stages totaling more than 1,400 bulbs with an additional 2,000 bulbs being replaced in table lamps. Reflective coating on roofs and photovoltaic arrays provided additional energy savings.

In 2003 alone, Warner Bros. estimated that their energy efficiency program saved over 4.3 million kilowatt-hours of electricity annually. Making *Syriana* carbon neutral (see the section on *The Day After Tomorrow*) is another example of Warner Bros.' commitment. The implementation of environmental programs happens with a significant amount of planning, education, and hard work. Shelley Billik, the Vice President of Environmental Initiatives at Warner Bros. has spearheaded the environmental agenda for Warner Bros. and is credited with accomplishing major milestones.

The Re-Refined Oil Program

Warner Bros. has switched their entire fleet of vehicles from virgin lubricating oil to re-refined oil. Since 1997, they have used re-refined oil in their fleet of over 400 vehicles including passenger cars, forklifts, and trucks. Although initially encountering some "hurdles," Warner Bros. successfully made the transition to re-refined oil without a single problem, and without additional costs or warranty issues. Warner Bros. has also implemented a used oil recycling program and returns all oil removed from their vehicles to be recycled and made back into re-refined oil. Warner Bros. conducts true closed-loop recycling with their environmentally-conscious motor oil program.

Warner Bros. is one of the few businesses in the motion picture industry that have implemented a re-refined oil program but they are among other California businesses and organizations that have implemented re-refined oil programs including Southern California Gas, the County of Los Angeles, the California Highway Patrol, Coca-Cola, United Parcel Service, the City of Sacramento, Waste Management, the U.S. Postal Service, Frito-Lay, CalTrans, the City of San Francisco, and Ventura County. Re-refined oil is even used on the NASCAR race circuit.

Environmental Benefits and Cost Analysis

For the year 2003, Warner Bros. diverted more than 2,900 tons of materials from the landfill which resulted in waste hauling and disposal savings of $150,000 plus additional revenue generated from the sale of recyclables that totaled approximately $25,000. The environmental benefits of diverting these materials from the landfill and using them for beneficial uses has resulted in more than 700 MTCE (Metric Tons of Carbon Equivalent) of greenhouse gas emission reductions, saved more than 12,000 trees, and nearly 11,000 MBTU (million British Thermal Units) in energy savings.[218] Additionally, Warner Bros. has reduced their energy use which resulted in savings of $760,000 annually.

The environmental benefits of using re-refined oil are three-fold: 1) used oil that was disposed of as a waste before can now be considered a renewable resource, eliminating

[218] NERC (Northeast Recycling Council, Inc.) Environmental Calculator, December 2004.

the negative impacts of disposing oil to the environment; 2) re-refining oil extends the life of a nonrenewable resource, fossil fuels, by converting used oil into a marketable material that can be used, recovered, converted, and used again; and, 3) 30 percent energy savings are realized because it takes roughly 1/3 the energy to re-process used oil than it does to refine crude oil into lubricant quality. Furthermore, the impacts of improper disposal of used oil can be devastating to the environment. For example, one gallon of used oil can contaminate one million gallons of drinking water.

Recommendations

Warner Bros. has implemented extensive environmental programs at their facilities and are considered to be an environmental leader in the motion picture industry. Warner Bros. is among the few businesses in the motion picture industry that have implemented re-refined oil and used oil recycling programs and are again in a position of environmental leadership in this area. CIWMB recommends that other members of the motion picture industry follow the Warner Bros. example by implementing these types of programs that minimize environmental impacts and provide greenhouse gas reductions, efficient resource management, energy savings, and boost the bottom line of the business through additional revenues and cost reductions.

Best Practice Example: ISO 14001 Certification at Sony Pictures

Background

Sony Corporation is a global electronics firm with entertainment operations, through Sony Music Entertainment Inc. (formerly CBS Records) and Sony Pictures Entertainment (formerly Columbia Pictures Entertainment).

The Sony Group has a proactive environmental vision, aimed at creating a sustainable society that applies throughout the group.[219] For instance, the vision states that:

> "Sony recognizes the importance of preserving the natural environment that sustains all life on earth for future generations and thereby ensuring that all humanity can attain the dream of a healthy and happy life. Sony is committed to achieving this goal by seeking to combine ongoing innovation in environmental technology with environmentally sound business practices."[220]

The Sony Group posts large amounts of detailed data about their environmental performance on the group website. For instance, Sony estimates that their sites emitted 2.09 million tons of CO_2 while the use of their products by consumers led to 14.06 million tons of CO_2 emissions.[221] However, based on the information presented, [222] it is not clear whether the entertainment divisions are included in these estimates.

Strictly speaking, ISO 14000 refers to a series of environmental management standards, though in practice it is often used to refer specifically to the ISO 14001 environmental

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[219] See http://www.sony.net/SonyInfo/Environment/environment/management/vision/index.html, last accessed July 3, 2005.
[220] http://www.sony.net/SonyInfo/Environment/environment/management/vision/index.html, last accessed July 3, 2005.
[221] See http://www.sony.net/SonyInfo/Environment/environment/management/overview/index.html, last accessed July 3, 2005.
[222] See http://www.sony.net/SonyInfo/Environment/environment/data/index.html, last accessed July 3, 2005.

management systems standard. It is analogous to the earlier ISO 9000 series of quality management systems standards. Both are generic standards, in the sense that they do not apply to specific industries; instead, they are deliberately designed as abstract, high-level process standards, to make them applicable to the widest possible range of organizations. Indeed, among the over 500,000 firms that have received ISO 9000 certification and the over 60,000 that have received ISO 14001 certification,[223] one can find organizations ranging from mines to universities and from steel mills to government agencies.

ISO 14001 at Sony

As part of Sony's environmental commitment, they have actively pursued ISO 14001 certification; as of April 2002, all Sony manufacturing sites worldwide had received certification.[224] Currently, Sony Pictures Entertainment is the only major studio to be ISO 14001 certified in the US, with their studio operations in Culver City, California. The certification was awarded on April 22, 2002.[225]

Sony already had environmental management practices in place prior to certification, so no immediate drastic reduction in emissions or waste is expected. Environmental staff at various certified firms explain that the ISO 14001 certification has helped to focus attention on environmental impacts of decisions. The standard does not require always following the environmentally preferred path, but it does require always including careful consideration of environmental impacts in making decisions. The ultimate decision is then the result of a deliberate assessment of economic and environmental consequences, rather than a purely economically-driven decision with environmental impacts that only become clear after the fact. In other words, even if the standard does not always lead to immediate environmental improvements, the educational effects can still be valuable.

Best Practice Example: Safety Passport Program[226]

Background

The Safety Passport Program is a skills and safety training program for the motion picture and television industry. Industry employees, representing 22 below-the-line unions (i.e., the unions representing technical and mechanical staff), carry "Safety Passports" as proof of their completion of training. The Safety Passport Program is administered by the Contract Services Administration Trust Fund (CSATF).

Contract Services Administration Trust Fund

"A non-profit organization, Contact Services Administration Trust Fund ("CSATF") administers a variety of programs for the benefit of the motion picture and television industry."[227] CSATF is provided for and governed by the collective bargaining agreement (Basic Agreement of 1996, Article XXV) by and between the Producers, The International Alliance of Theatrical Stage Employees ("I.A.T.S.E."), the Moving Picture Technicians Artists and Allied Crafts of the United States, its Territories, and Canada ("M.P.T.A.A.C"); was well as the collective bargaining agreements by and between the

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[223] See *The ISO Survey of ISO 9001:2000 and ISO 14001 Certificates – 2003*, ISO, 2004, available at http://www.iso.org/iso/en/iso9000-14000/pdf/survey2003.pdf, last accessed May 30, 2005.
[224] See http://www.sony.net/SonyInfo/Environment/environment/data/history/index.html, last accessed July 3, 2005.
[225] See http://www.sony.com/SCA/press/020429.shtml, accessed on December 28, 2004.
[226] Original version contributed by Joanna Hankamer and Jeannie Olander.
[227] http://csatf.org/index.shtml, accessed on February 2, 2005 and April 18, 2005.

Producers and the Basic Crafts Locals (Article 18). CSATF is administered by a Board of Trustees appointed by the Alliance of Motion Picture & Television Producers ("AMPTP"). Signatory Producers make contributions to the CSATF for each hour worked by or guaranteed a covered employee.[228]

In addition to administering training courses, CSATF maintains industry rosters, provides centralization of I-9 documentation, and distributes safety bulletins. The safety bulletins are guidelines, not laws or regulations, to be "reproduced and attached to the Call Sheet[229] or otherwise distributed to affected employees."[230]

History of CSATF and the Safety Passport Program[231]

The Alliance of Motion Picture & Television Producers (AMPTP) has had a safety committee going back to the 1970s. A committee would meet once a month to decide upon news to publicize and information to disseminate. Safety bulletins were signed off by the major studios and labor unions, and then distributed or posted on a website along with other general information.

In 1995, the Safety Passport Program was proposed as a centralized safety training mechanism for the industry. Born out of a growing concern for accidents and liability, an inefficient system of duplicate decentralized studio training programs, and a transient workforce, the Safety Passport Program was created to standardize and centralize training efforts. Its administrator, Contract Services Administration Trust Fund, resulted from a collective bargaining agreement between the producers and the unions and an unprecedented arrangement by Cal OSHA to provide for the consortium for multiple employers. This consortium is now required of the industry by Cal OSHA. Individuals receive 9-12 hours of safety-related training; those who do not complete the training are dropped from the industry roster.

In an industry made up of transient and freelance subcontractors, communication and dissemination of information is a major challenge. The Safety Passport Program is a case study in communicating and implementing industry-wide change, and a case study in creating the infrastructure to allow for future change.

Any training on environmental issues would have to have a monetary benefit to the industry, whether through a reduction in production cost or in liability. Although courses on environmental best practices would certainly be appropriate, relating as they do to "safety" on a larger scale, the lack of perceived urgency and necessity for such courses, would likely be obstacles in the search for funding for such courses. Apart from the approval and funding issue, creating and conducting such courses would be relatively easy, given the existing infrastructure.

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[228] http://csatf.org/index.shtml, accessed on February 2, 2005 and April 18, 2005.
[229] A call sheet is defined as "A sheet which notes which scenes will be shot the next day, and the basic cast, crew and special requirements for each scene, as well as scene times and call times," on http://www.geocities.com/Hollywood/Set/6058/glossary.html, last accessed May 22, 2005.
[230] http://csatf.org/index.shtml, accessed on February 2, 2005 and April 18, 2005.
[231] The information reported here was obtained from interviews by members of the research team with various individuals familiar with the Safety Passport Program.

Environmental Production Guides

This section provides a summary of several environmental production guides[232] or environmental checklists developed by individuals or organizations within the motion picture industry. The most recent addition to this list, the Green Seal Award developed by the Environmental Media Association, includes a rating system. We first discuss the various environmental production guides we encountered, and then draw on experience in other industries with the ISO 14001 environmental management system standard and the LEED standard for green building to offer some suggestions for requirements that need to be met for any environmental production guidelines for the motion picture industry to be widely adopted.

Existing Green Guidelines for the Motion Picture Industry

Some of the existing environmental production guidelines provide a better understanding of the nature of these guidelines. We have encountered four sets of environmental production guidelines:

- The *Environmental Guide* by the AIPC (1991).
- The book *Low-Impact Filmmaking* (Fessenden and Ellenbogen, 1991).
- The guidelines on the EMA website, including the Green Seal Award checklist.
- The EIDC Environmental Production Guide.

We briefly review these guides here; more complete descriptions are provided in Appendix D.

1991 *Environmental Guide* by the AIPC

This guide was produced as a grassroots effort by a few independent commercial producers. Only one edition was printed, it has not been updated or maintained since the original edition. The guide is organized into three areas: in the office, on the set, and on location. The guide is written in an informal anecdotal style, and while much of it is the inevitable checklist of basic good environmental practices, it includes some very detailed suggestions specific to the motion picture industry, for instance related to lighting arrangements that can reduce energy consumption and hence cost.

Low-Impact Filmmaking (Fessenden and Ellenbogen, 1991)[233]

Larry Fessenden is an actor/writer/director/producer, who writes, in the Author's Note:

> "I will tell you quite directly that it is no pleasure being the messenger of environmental reform. For reasons that seem deeply psychological and cultural,

[232] Several different terms have been used for this concept: "itemized environmental checklist and rating system," "green environmental management plan," "green guidelines," "green guides," "environmental production guide," "green production guide," etc. Within the motion picture industry, the term "environmental production guide" seems to be the most common, so that is the terminology we will adopt here.

[233] *Low Impact Filmmaking: A Practical Guide to Environmentally Sound Film and Video Production*, Larry Fessenden and Michael Ellenbogen, available from Glass Eye Pix at http://www.glasseyepix.com/html/low.html, last accessed May 23, 2005.

environmentalism remains deeply unpopular, open to all sorts of sarcasm and condescension, even from groups that generally take the road to reform. But I have to believe things are changing."

The book first provides a short discussion of environmental issues aimed at each of the department heads, ordered from start to finish of any project (the script, production office, director, location, transportation, casting, actor, catering, etc.). It contains a short discussion of how these ideas were applied during the filming of *No Telling* (1991). It provides a list of products and companies that should be avoided, in the authors' opinion, and concludes with a list of vendors of environmentally sound products and services.

For *No Telling*, the production hired an environmental consultant fairly early on, with the intention of keeping the production itself consistent with the environmental theme of the film. The book discusses how the production distributed educational material on environmental matters and animal rights to the crew, how mostly recycled paper was used, how the original effort to use "hard dishes" failed after a few days as washing the dishes took too much time,[234] and other examples of initiatives that succeeded or failed.

EMA Standards and Green Seal Award Checklist[235]

The Environmental Media Association updated their green guidelines some time during 2004. It includes sections on "production offices and around the set," "green standards for characters," "how to make a production green," and the checklist for the Green Seal Award. The guidelines are generally one-line practical suggestions, some of which are fairly easy to implement, others likely require more effort or expense.

In addition to these guidelines, the checklist for the EMA Green Seal award asks applicants to rate their own production on a 5-point scale on eight dimensions, such as use of sustainable building materials for set construction, use of low-VOC paints, leasing hybrid vehicles for the production, etc.[236] The applicants for the award rate their own performance on these dimensions, the winners are honored at the Environmental Media Awards ceremony in Fall each year, starting from Fall 2004.

EIDC Environmental Production Guide[237]

The Entertainment Industry Development Corporation (EIDC) maintains an environmental production guide, which was being updated as of May 22, 2005. The categories of green guidelines offered are the production office, on location (in progress), set construction, props, catering, lights and camera, and green purchasing. The guidelines are similar in style to those on the EMA website: one-line practical suggestions, sometimes including a few more specific examples. The EIDC site also includes links to vendors for a subset of the green products and services mentioned.

Existing Environmental Standards in Other Industries

There exists a wide range of sets of guidelines for environmental operations in other industries. Two of the most formal and rigorous schemes are the LEED (Leadership in

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[234] Fessenden and Ellenbogen (1993), pp. 57-58.
[235] See http://www.ema-online.org/what_you_can_do.htm for the green guidelines and http://www.ema-online.org/awards_green_seal.htm for the Green Seal checklist, last accessed May 22, 2005.
[236] This list is taken from the Green Seal Award checklist available at the EMA website at http://www.ema-online.org/pdf/2005_ema_green_seal_entry.pdf, last accessed May 22, 2005.
[237] See http://www.eidc.com/epg/Env_Prod_Dept/env_prod_dept.html.

Energy and Environmental Design) green building rating system[238] and the ISO 14001 environmental management systems standard.[239]

LEED

The US Green Building Council explains the intentions behind the LEED scheme as follows:

> "LEED was created to:
>
> - define "green building" by establishing a common standard of measurement
> - promote integrated, whole-building design practices
> - recognize environmental leadership in the building industry
> - stimulate green competition
> - raise consumer awareness of green building benefits
> - transform the building market
>
> LEED provides a complete framework for assessing building performance and meeting sustainability goals. Based on well-founded scientific standards, LEED emphasizes state of the art strategies for sustainable site development, water savings, energy efficiency, materials selection and indoor environmental quality. LEED recognizes achievements and promotes expertise in green building through a comprehensive system offering project certification, professional accreditation, training and practical resources." [240]

It is interesting to note how these objectives would apply perfectly to the motion picture industry too. Initially, LEED was apparently not very enthusiastically accepted by the architectural and construction communities, but now it has become very successful, and is being extended to commercial interiors, remodeling projects, and even residential applications in the "LEED for Homes" program that was scheduled to start in Summer of 2005.[241] The recent episode of ABC's *Extreme Makeover: Home Edition* featuring a zero-energy house has apparently also sparked significant interest among builders.[242]

Several factors are likely to have contributed to the success of LEED:

- The standard is carefully developed, comprehensive in nature, and based in a solid understanding of the environmental impacts of commercial buildings.
- The standard includes an objective certification scheme which requires significant documentation that can be audited by third parties before the certification is awarded.

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[238] See http://www.usgbc.org/; last accessed May 30, 2005.
[239] See http://www.iso.org/iso/en/iso9000-14000/index.html; last accessed May 30, 2005.
[240] See http://www.usgbc.org/DisplayPage.aspx?CategoryID=19, last accessed May 30, 2005.
[241] In "Is Green Building Budding? Experts See a Gathering Momentum For Design Efficiency, Conservation," Sandra Fleishman, in *Washington Post*, 4/16/2005; accessed at http://www.usgbc.org/News/usgbcinthenews_details.asp?ID=1485&CMSPageID=159, May 30, 2005.
[242] Interestingly, when we contacted the show's production company and sponsor for this study, during 2004, the only response we received was from the sponsor, politely declining any participation in our study.

- Over time, extensive studies show that LEED certification does not need to add much, if any, upfront cost, and in fact tends to be cost-efficient, due to the energy savings alone, but even more so if one also accounts for the resulting increase in employee productivity.[243]

- This in turn leads to significant demand from developers and corporate customers for LEED expertise.

The amount of time and money spent developing LEED does contrast sharply with what is likely to be available in the motion picture industry, which is not unreasonable given that buildings are the largest consumer of energy in the US, accounting for 39 percent of the total.[244]

In conclusion, the LEED framework is an example that is highly instructive for future efforts to developing and implementing an industry-wide guide for green production in the motion picture and television industry, but one should not expect that the motion picture industry can sustain a similar level of investment and activity as the US Green Building Council and the building industry in general are able to do. Instead, though, the major value of the LEED framework for the motion picture industry is likely to lie in facilitating the industry's adoption of green buildings for its offices and homes. The example noted earlier, of how Warner Bros. applied the new LEED Standard for Commercial Interiors in remodeling their Television Distribution Building 151, [245] shows at least one step in this direction.

ISO 14001

Strictly speaking, ISO 14000 refers to a series of environmental management standards, though in practice it is often used to refer specifically to the ISO 14001 environmental management systems standard. It is analogous to the earlier ISO 9000 series of quality management systems standards. Both are generic standards, in the sense that they do not apply to specific industries; instead, they are deliberately designed as abstract, high-level process standards, to make them applicable to the widest possible range of organizations. Indeed, among the over 500,000 firms that have received ISO 9000 certification and the over 60,000 that have received ISO 14001 certification,[246] one can find organizations ranging from mines to universities and from steel mills to government agencies. Sony Corporation has mandated that all its operating units worldwide seek ISO 14001 certification, and Sony Pictures Entertainment in Culver City, California, does indeed have the certification.

ISO 14001 does not have an equally precise scoring system as LEED; instead, there is more leeway for auditors to interpret the original standard. For instance, ISO 14001

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[243] Greg Kats, "The Costs and Financial Benefits of Green Buildings: A Report to California's Sustainable Building Task Force," October 2003. Available online at http://www.usgbc.org/Docs/News/News477.pdf, last accessed May 30, 2005.

[244] Fleishman quotes the US Department of Energy as the source of this figure in "Is Green Building Budding? Experts See a Gathering Momentum for Design Efficiency, Conservation," Sandra Fleishman, in *Washington Post*, 4/16/2005; accessed at http://www.usgbc.org/News/usgbcinthenews_details.asp?ID=1485&CMSPageID=159, May 30, 2005.

[245] http://wbenvironmental.warnerbros.com/wb_enviro_1_9_9.swf, last accessed on April 27, 2005.

[246] See *The ISO Survey of ISO 9001:2000 and ISO 14001 Certificates – 2003*, ISO, 2004, available at http://www.iso.org/iso/en/iso9000-14000/pdf/survey2003.pdf, last accessed May 30, 2005.

requires that firms demonstrate "continuous improvement" in their environmental efforts, but no specific target is required.

There exists considerable uncertainty, especially in the US, about the relevance of ISO 14001, but, by contrast, the fact that over 60,000 firms worldwide have already adopted the standard indicates that it is frequently considered valuable.[247] Moreover, although similar skepticism exists about ISO 9000, some studies suggest that there are financial benefits to seeking ISO 9000 certification.[248] One example of a firm in the motion picture industry that has successfully attained ISO 9000 certification is Cinnabar, a set construction and special effects company in Burbank, California:

> "According to CEO Jonathan Katz, holding the company to this internationally recognized standard allows it to compete more effectively in today's global marketplace. "ISO certification has enabled us to ensure quality control and boost productivity," he says. "It also is an effective management tool for reinvigorating a company that has gotten set in its ways. The ISO certification process acted as a change agent to propel our business into the new century."
>
> "ISO gave us a structure and methodology to empower more people in the company to make decisions," says Katz. "It has improved our company's operations, boosted teamwork and employee morale, and it gives our customers additional security in the integrity of our service."[249]

Many of these same type of benefits have been reported by firms achieving ISO 14001 certification.[250]

In the context of the motion picture industry, one might think of ISO 14001 being potentially useful in several ways. First, the major players, i.e., the studios, are likely to experience some benefit from ISO 14001 certification, as Sony Pictures most likely did. Some of the studios already have quite advanced environmental management initiatives present on-site, so it is entirely possible that ISO 14001 would not, in itself, improve their environmental performance, but in such cases it can be helpful as a clear way of communicating the importance of the existing environmental initiatives to all those who work at the studio, whether as employees or contractors.

To achieve this benefit, the implementation would likely have to be public, and involve third-party certification. That is not without cost, both financial and in terms of time, so environmental managers at studios may well, reasonably, consider this an inefficient use of their time. By contrast, environmental managers elsewhere have reported that ISO 14001 certification helped them as it allowed them distribute the responsibility for environmental issues throughout the organization, hence saving the existing environmental department time and effort in the longer run.[251]

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[247] Some of the misconceptions about the ISO 14000 standard are discussed in Corbett and Kirsch (2000).
[248] See Corbett, Montes, Kirsch and Alvarez-Gil (2002). The evidence to date is not unambiguous, but this is the largest study of the impact of ISO 9000 that we are aware of.
[249] See http://www.cinnabar.com/cinnabar1/our_company/in percent20the percent20news/press/press_1.html; last accessed May 30, 2005.
[250] See, for instance, Corbett, Luca and Pan (2002). Many studies show that implementing ISO 9000 and 14000 does not only lead to improvements in quality and environmental performance but also to other, organizational benefits such as those experienced at Cinnabar.
[251] See Corbett and Kirsch (2000), page 12.

Second, ISO 14001 is often seen as part of a proactive environmental communications strategy.[252] In this context, a US interviewee described ISO 14001 as an excellent "stage on which to showcase changes in environmental performance." The certification can provide a framework for effective communication about environmental management, with enhanced credibility due to the third-party audits.

Third, for any studio or other firm that does not yet have an environmental management system in place, the framework provided by ISO 14001 is a reasonable place to start. The first steps in the process require a firm to formulate an environmental policy, to identify its environmental impacts, and to put in place plans to mitigate those impacts. That, alone, can be useful for a firm that has not gone through this exercise before. Moreover, these benefits do not depend necessarily on obtaining third-party certification, though the third-party certification may lend additional rigor to the firm's efforts.

Finally, firms in the motion picture industry, whether major studios or production companies, can encourage their suppliers to seek ISO 14001 certification. This has been common in other industries with proactive environmental attitudes; IBM, for instance, sent a letter to its major suppliers as early as 1998 encouraging them to seek ISO 14001 certification,[253] (the ISO 14001 standard was only introduced in 1996.) Many of the suppliers to the motion picture industry are small firms or independent contractors, for whom requiring ISO 14001 certification would be disproportionate, but many other vendors (equipment, lumber, transportation, lodging, etc.) are large enough for this requirement to be reasonable.

Animal Welfare Standards in the Motion Picture Industry

One has to recognize that the success of a film or TV show will almost always depend more on the content than on the process by which it was made. It is hard to imagine that a film would earn higher box office revenues simply by scoring higher on an environmental rating. However, a film or TV show that is known to transgress basic principles of environmental stewardship might conceivably suffer if audiences refuse to see it, as suggested by the American Humane Association's (AHA) Film & Television Unit experience with the treatment of animals. For instance, James Cameron's *The Abyss* contained a scene in which a rat was held underwater until it begins to struggle; the AHA censured the film with the rating "unacceptable," and the scene had to be cut before it was distributed in the UK to comply with British law.[254] The AHA maintains a database of films[255], where individual films are rated "acceptable," "believed acceptable," "unacceptable," etc. (The specific rating scheme was modified in July 2004.) The AHA claims that:

> "Ratings from American Humane can help increase the film's distribution. Some distributors will not market a production without a disclaimer from the American

[252] See Corbett and Kirsch (2000), page 11.
[253] See Corbett and Kirsch (2000), page 11.
[254] Daniel Engber, "No Animals Were Harmed...?", *Slate*, April 27, 2005; available at http://slate.msn.com/id/2117565, last accessed June 1, 2005.
[255] See the ratings at http://www.americanhumane.org/site/PageServer?pagename=pa_film_profiles; last accessed June 1, 2005.

Humane Association, and networks often require a sign-off letter from American Humane before airing commercials with animals."[256]

The AHA is the only animal welfare organization designated by the Screen Actors Guild to oversee animal wellbeing on sets. The AHA has been active on movie sets since the 1940s, after a horse was forced to leap off a cliff to its death while shooting *Jesse James*. The AHA drew public attention to animal cruelty in *Heaven's Gate* in 1980, which led to the agreement between AHA and the SAG and the Alliance of Motion Picture & Television Producers. The "No Animals Were Harmed..." disclaimer commonly seen at the end of movies is a registered trademark of the AHA since 1989. [257]

Interestingly, during our conversations with individuals within the motion picture industry, the animal welfare analogy was raised several times as a model towards which the environmental production guidelines should strive. The encouraging conclusion one can draw from this is that an outside organization such as the AHA can be effective in ensuring widespread adoption of better practices.

Conclusions From Existing Environmental Production Guides

From the above overview of the environmental production guides, and contrasting them to the LEED and ISO 14001 frameworks, several common themes emerge:

- Virtually nowhere do the existing environmental production guides discuss the economic implications of the recommendations. Some do not lead to additional costs, such as the suggestion to donate leftover food, while others are likely to be more expensive, such as the suggestion to use steel instead of lumber for set construction.

- Relatively few of the suggestions lead to clear cost reductions, and even for those that do, these cost savings are not emphasized or quantified. For instance, purchasing used furniture, or switching off lights and using EnergyStar equipment, will help to cut costs, but based on our interview findings, such cost savings need to be significant before someone will act on them. The studies demonstrating cost savings resulting from LEED certification likely played a major role in the increased acceptance of the LEED framework.

- None of the environmental production guidelines quantify the environmental effects of following the suggestions, so it is difficult to decide how to prioritize. The EIDC and EMA do both offer condensed lists in the form of the EMA Green Seal checklist, and EIDC's "10 ways to be an environmentally friendly production manager."[258] However, there are many calculators available that would facilitate quantifying the environmental benefits of adopting certain recommendations. The Economic Input-Output Life-Cycle Assessment[259] method used earlier in this report would be one method; other calculators are those posted at the Northeast Recycling Council (NERC)[260] and the EPA's Personal Greenhouse Gas Calculator.[261] Establishing an

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[256] http://www.americanhumane.org/site/PageServer?pagename=pa_film_producers; last accessed June 1, 2005.
[257] Daniel Engber, "No Animals Were Harmed...?", *Slate*, April 27, 2005; available at http://slate.msn.com/id/2117565, last accessed June 1, 2005.
[258] See http://www.eidc.com/epg/Green_Intit/what_do_first/what_do_first.html, last accessed May 22, 2005.
[259] See http://www.eiolca.net, last accessed May 22, 2005.
[260] See http://www.nerc.org/documents/aboutcalc.html, last accessed May 22, 2005.

easy-to-use link between the existing green production guidelines and some of these calculators would help to identify the main impacts, and hence where best to focus one's efforts.

- The guidelines, though specific, do not discuss the "how to" question, or give advice about handling the challenges that inevitably arise with almost any one of these recommendations.

- The EMA's Green Seal award is the only guide that includes a rating scheme. Although the specific rating scheme used there is highly simplified and self-reported, it is a substantial step better than having no rating mechanism at all. Attaching scores (preferably combined with the calculators listed above) would help producers decide where they need to focus their efforts. There is no third-party audit of any of these green production schemes, unlike the situation for LEED or ISO 14001.

- Updating these environmental production guides is a significant undertaking, and does not appear to occur frequently. LEED and ISO 14001 are both backed by a major infrastructure of consultants, auditors, and organizations dedicated to developing and maintaining the standards. Moreover, these organizations are at least partly independent of the industry they are aimed at, lending credibility to the standards and to the rating schemes associated with them.

- Presumably as a consequence of this lack of resources available within the motion picture industry to manage an environmental production guide, the four that we encountered do not appear to have had much impact within the industry, despite being well-intended. Indeed, the AIPC guide was mentioned only once, as an example of a well-intended effort that had become obsolete due to lack of support,[262] *Low-Impact Filmmaking* was not mentioned at all, and uncovered only during the research team's own literature search, and the EMA and EIDC guides were rarely mentioned and even then only in passing. Hence, any attempt at developing a new set of environmental production guidelines for the motion picture industry should focus heavily on how to ensure widespread diffusion and adoption of the guidelines.

Recommendations on Implementation of Green Production Guidelines

Based on the preceding observations, we believe that in order for an environmental production guide to have meaningful impact on the motion picture industry, it would have to be supported by an organization with sufficient environmental knowledge to be able to appropriately prioritize among the range of environmental impacts mentioned so far in this report. Sufficient resources would also be necessary to actively maintain and update the standard, and to provide some form of third-party verification. Naturally, the environmental production guide would also have to have significant buy-in from within the industry itself. No single organization comes to mind, but a coalition of several existing organizations may be appropriate.

- The environmental background could be provided by organizations such as Global Green and NRDC, both with significant activities in the Los Angeles area and with

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[261] See http://yosemite.epa.gov/oar/globalwarming.nsf/content/ResourceCenterToolsGHGCalculator.html, last accessed May 22, 2005.
[262] The AIPC guide was loaned to us by SUB006; no other respondent mentioned it.

close ties to the motion picture industry; possibly in conjunction with academic institutions such as the UCLA Institute of the Environment, the UC Santa Barbara Donald Bren School of Environmental Sciences and Management, or others.

- The infrastructure and resources to manage the environmental production guide on a day-to-day basis might exist within organizations such as the California Film Commission; although some might argue that the CFC's ties to the industry are too close to provide the level of independence that would ideally be present.

- Support from a range of industry associations would be critical. The Environmental Media Association (EMA) and the Earth Communications Office (ECO) are currently the leading environmental voices of the industry. Other associations though would also play an important role in spreading the standards to their members: the Directors' Guild of America (DGA), the Producers' Guild of America (PGA), the Screen Actors' Guild (SAG), the Screen Writers' Guild (SWG), the Location Managers' Guild of America (LMGA), and various unions.

Recall, though, that the American Humane Association has been able to enforce widespread adoption of practices aimed at improving animal welfare, so a sufficiently credible and activist environmental organization could conceivably achieve a similar influence without necessarily forming such a coalition. (The AHA did strike an agreement with the SAG and the AMPTP, but only after negative publicity about poor treatment of animals.)

The analysis carried out here suggests that a series of coordinated measures can be taken within the Motion Picture Industry to control environmental impacts and reduce the industry's environmental footprint. Based on the case studies and "best practices" examples discussed earlier, for example, the following actions would seem to be practical on an industry-wide basis:

- Continuing subscription to recycling programs for film stock and other production materials on site (e.g., paper, glass, plastic, etc.).

- Implementation of vehicle use standards aimed at reducing emissions and recycling of materials (e.g., oil and rubber).

- Adoption and distribution of the EMA Green Seal Award checklists and EIDC production guidelines during pre-production phases of project development.

- Assessment during preproduction of usage of and recycling plans for set structural materials.

- Auditing production sites for energy efficiency and potential cost savings.

- Setting aside from profits a small fraction to support environmental partnerships with organizations such as Tree People, The ReUse People, and so on.

- Provisions of stipends for motion picture industry employees to develop individual environment-oriented projects that reduce post-production environmental impacts.

- Continuing partnerships with environmental and academic organizations to design general guidelines and checklists, as well as cost analyses, for industry-wide applications.

Outreach

This section contains a summary of the two "Green Light Discussion" events that were held in connection with this project, the first on April 14, 2004, the second on February 4, 2005, both at the UCLA Anderson School of Management.

Green Light Discussions I: April 14, 2004

Event summary

Hollywood insiders and environmental leaders gathered at the UCLA Anderson School of Management to discuss sustainability in the Southern California motion picture, film and television industry. The event started with a reception, followed by a 90-minute panel discussion and concluded with an open question and answer session.

Over 100 attendees were treated to insights and anecdotes from a select group of panelists moderated by Professor Charles Corbett, Associate Dean of the MBA Program at the Anderson School. The panelists were:

- Barbara Boyle: Professor, Chair, Department of Film, Television and Digital Media, UCLA; Film and television producer.
- Lisa Day: Director of Global Projects, Earth Communications Office (ECO).
- Michael Glick: Senior Vice President, Physical production, MGM Pictures and United Artists.
- Michael H. Kelly: Deputy Director, California Film Commission.
- Gretchen S. Lewotsky: VP of State and Local Affairs and Environmental operations for Fox Entertainment Group.

The diverse crowd of attendees included environmental managers from Hollywood studios, other representatives from the movie and TV industry, faculty and students from the Anderson School and other departments at UCLA, business owners, community members and more. The issues discussed ranged from current environmental practices and runaway production to modeling environmental behavior in film and television.

Looking at the Motion Picture Industry Sustainability in terms of its environmental, economic and social dimensions stimulated lots of discussion. Panelists expressed concern about the environmental practices in the industry, but were proud of the work they do in the communities they shoot in and on the studio lots. Many were hopeful that the exposure that film and television get could be utilized as a vehicle to model more sustainable behavior.

Panelists discussed sustainable practices being implemented at the studios. One of the studios is implementing programs to reduce greenhouse gas emissions and working to empower employees in this direction as well. The studio works with a climate registry organization that analyzes their energy use and translates it into emissions. Then they purchase energy credits or plant trees to offset the carbon emissions. The necessity to work with other organizations and to embrace environmental practices emerged as a central theme to addressing sustainability at the studio level.

Panelists highlighted the need for sensitivity to the environment in all aspects of film and television production. Recognizing the culture of celebrity, panelists discussed

opportunities for the film and television industry to be helpful in implementing and promoting sustainable practices in the southern California region and on location around the world.

Green Light Discussions II: "From the Red Carpet to Green Productions," February 4, 2005

Event summary

The Motion Picture Industry Sustainability Forum was held on Friday, February 4, 2005 at the UCLA Anderson School of Management. The event was free to participants. About 260 individuals registered for the forum, and about 155 individuals attended the event. Attendees included producers, directors, writers, set designers, location managers, representatives from several major studios, entertainment services, media marketing, special effects companies, film companies, industry associations and guilds, environmental, regulatory and legal affairs managers, as well as professors and students.

California Integrated Waste Management Board Chair Rosario Marin and Board Member Michael Paparian spoke at the event, and California Environmental Protection Agency Cabinet Secretary Terry Tamminen provided filmed opening comments. Speakers included Ed Begley, Jr., Jason McLennan (sustainable building architect), and representatives from The Walt Disney Company and 20th Century Fox along with a variety of location managers, film commissioners, and reuse organizations that have worked on major features like *The Lord of the Rings* trilogy, *The Matrix: Reloaded*, *The Matrix: Revolutions*, *Dante's Peak*, and *Lords of Dogtown*.

The Forum generated a broad discussion of environmental issues in the motion picture and TV industry. The event was filmed by students at the UCLA School of Theater, Film, and Television.

Information provided at the booths included CIWMB's RecycleStore, Waste Reduction Awards Program, California Materials Exchange (CalMAX) program, recycled oil and tires, resource guide for more environmental sustainable entertainment productions (Appendix C), and the use of rainforest lauan in set construction. Other information was provided by UCLA School of Film and Television, U.S. Environmental Protection Agency (Region 9) and Environmental Finance Center (Region 9) (environmental messages in film), Hollywood Recycles (on location beverage container recycling program), and L.A. SHARES (a local reuse organization). Food was provided by UCLA's (contractor) caterer, and was presented in an environmentally sustainable manner by being served in batches so uneaten food could be donated to a local women's shelter.

The Environmental Media Association and NativeEnergy jointly donated 5 tons of CO_2 offsets to make the event carbon-neutral. The program was printed on 100 percent recycled paper.

Outcomes

The event appeared to be very well-received by the participants, and led to several outcomes.

- The Environmental Finance Center 9 established contacts with a major TV studio to jointly examine the effects of environmental messages on consumer behavior.

- The VP of a production company attended, and has had exploratory discussions about how to make their next film environmentally sound.
- Several other contacts were made between individuals attending the conference and seemed likely to lead to innovative partnerships for a range of environmental programs.

Conclusions and Recommendations

Some of our interviewees consider the motion picture industry to be unique, while others resolutely contradict that. This carries over to the environmental practices within the industry: those who believe the industry is unique are more likely to feel that the planning, construction, disposal and energy-efficiency approaches that work in more traditional industries can, almost by definition, not work in the motion picture industry. Others, though, view the motion picture industry as much more similar to traditional manufacturing industries than many would like to admit, implying that there is little excuse for not adopting the same principles as firms in other industries do. In some respects, several individuals within the industry have indeed implemented programs that firms in any other industry would be proud of. In others, however, the industry is decidedly conservative, both in terms of adopting new programs and in terms of discussing them with the public.

In the experience of the first author of this report, many firms in other industries across the world have been very open to discuss their environmental practices and performance with academics, almost never expecting anything in return. They do sometimes request anonymity, but do agree to let the general findings from discussions with them be published. They seem eager to help educate academics about their environmental practices, knowing that that will in turn help educate others. Many firms are also well-known for publishing extensive corporate environmental reports, often including details of environmental problems faced.

Somewhat surprisingly, the motion picture industry, (particularly the studios), does not seem to share this openness or transparency. A number of individuals at studios have been exceptionally generous with their time (including, but not limited to, the individuals who spoke at our two conferences), but their also seems to be a widespread and deep-seated fear that any publicity about their environmental programs will attract unwanted attention to issues that still need to be addressed. The fear of being “singled out” was evident, sometimes even explicitly so; none want to be the first to implement environmental programs that are not at least cost-neutral, and none want to be public about their initiatives without at least several other studios following suit.

From the environmental impact estimates, greenhouse gas emissions are clearly an area where the motion picture industry can be considered a significant contributor. From the interviews, it is clear that very few people in the industry are actively engaged with greenhouse gas emission reduction, or even with discussions of the issue. Firms in other industries are already publishing detailed inventories of their greenhouse gas emissions,

for instance based on the *The Greenhouse Gas Protocol*[263] by the GHG Protocol Initiative.

Similarly, firms in other industries are already participating in voluntary GHG emissions trading schemes, we are not aware of any efforts along these lines within the motion picture industry (other than limited efforts to purchase carbon offsets to make projects carbon-neutral). Given Governor Schwarzenegger's repeated pronouncements about his intention to reduce greenhouse gas emissions in California, it would be wise for any industry with major presence in California to take such issues seriously.

In light of the good work that has already been done within the studios, and the generally progressive attitudes of the motion picture industry, it would be highly valuable for the heads of the studios to jointly take a public stand on the importance of environmental issues for the industry. Once that is done, many others will feel liberated to pursue opportunities for environmental improvement and to discuss their successes (and failures) more openly.

[263] *The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard*, Revised Edition, by the World Business Council for Sustainable Development and the World Resources Institute, see http://www.ghgprotocol.org/standard/index.htm, last accessed July 5, 2005.

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Appendix A: Interviews Conducted

We conducted interviews with 49 individuals, under condition of anonymity. A summary description of the sample follows. This list does not include the speakers at the two conferences unless they were also interviewed separately from those events.

- Writer (1).
- Writer / producer / director (2).
- Producer (3, including 1 focusing on commercials and independent films).
- Executive producer, T.V. studio (1).
- Line producer (2); line producer / assistant director (1).
- Director (2).
- Executive director, digital production (1).
- Freelance editor (1).
- Assistant cameraman (1).
- Location manager (2).
- Costume designer (1).
- Set designer (1).
- Production designer (1).
- Production manager (1).
- Grip and dolly grip (1).
- Studio executives, at vice-president and senior vice-president level, in finance and production (6, including 1 former studio executive).
- Various representatives (7) from major studios, responsible for environmental and safety issues and government affairs.
- Representatives from specialized consulting firms, service providers and industry associations (10).
- Educators (2).
- Local and state government representatives (2).

Based on our interviews, the main omissions from this list are likely actors (though Ed Begley Jr. did speak at our second forum) and directors of photography. The former category is highly visible to the public and can be quite influential; the second group is less visible but apparently can also be quite influential on the set.

The interviewees and the participants at the two conferences held at UCLA (in 2004 and 2005) currently work at or have previously worked at the following studios: ABC, Disney, DreamWorks, MGM, Sony Pictures Entertainment, Touchstone, 20th Century

Fox, Universal, Warner Brothers. (Note: several of these companies are owned by others on this list.)

A selection of the major feature films and T.V. movies and series that the interviewees have been involved with include: *According to Jim, Anaconda, The Animal, Barbarians at the Gate, Blade, Blind Justice, The Cable Guy, Catch Me If You Can, City of Angels, Collateral, Dante's Peak, The Day After Tomorrow, Dogma, Doctor Dolittle, Falcone, Free Willy 2, The Godfather Part II, House, I Know What You Did Last Summer, Kiss the Girls, The Lord of the Rings trilogy, The Lords of Dogtown, The Matrix trilogy, The Patriot, The Replacements, The Return of the Man from U.N.C.L.E., Rocky 2, Rules of Engagement, Seabiscuit, Sex and the City, Speed 2, Starship Troopers, The Terminal, True Lies, US Marshals, Volcano, The Wedding Planner.*

In all cases, interviewees' remarks to us should be interpreted as their personal opinion rather than as representing any of these organizations or productions.

Appendix B: Interview Questions

Due to the wide range of positions of the people we interviewed, the interviews covered a wide range of topics, and the questions asked depended on the interview. We also decided that it was imperative to speak with a broad range of people first, before targeting any segment of the industry for in-depth, structured interviews, and due to the difficulties we encountered in arranging interviews, this second phase of interviews did not occur.

We prepared for each of the interviews conducted with the individuals listed above by constructing a broad list of interview questions; the specific questions asked would vary from interview to interview, depending on the background and experience of the interviewee. Hence, not every question in the following list was asked of every interviewee; some questions were asked in several interviews, some not at all.

Program Structure and Management

- What environmental management programs are in place at this company?
- Are there reports available that describe the environmental program and its impacts?
- With respect to the environmental program, what is the company perception of "sustainability" as a business goal?
- Describe the administrative structure and chain of authority for the program.
- Who within the company is specifically responsible for determining policies, controlling implementation, and enforcing compliance with the program?
- Is the program top down or bottom up?
- What aspects of the company's business does the environmental program consider?
- Which of the organization's operations are under the purview of the environmental program?
- What are the main objectives of the environmental program?
- How does the company mission shape the program, and how does the program fit in with the mission?
- Does management consider environmental policies when hiring sub-contractors?
- What are the mechanisms and guidelines for ensuring environmentally acceptable standards of practice by subcontractors?
- How are the effectiveness and impact of the environmental program assessed or quantified by management?
- What is the role of economic factors in the operation and maintenance of the environmental program?
- How are changes in the organization, policies and procedures of the environmental program determined and implemented within the company?
- Is information developed by the environmental program dispersed beyond the management team? Outside the company, but within the industry?

- Is the environmental program used for marketing and/or public relations purposes?
- Is the program described on the company website? In brochures, or other promotional materials?

Program Training and Incentives

- Does the company provide training to employees regarding environmental policies?
- Which employees are given such training, and what is the extent of the training?
- Describe the incentives that the organization uses to support and encourage the development of the environmental program.
- Describe the incentives that the organization uses to maintain internal compliance with its program.
- Describe the restrictions/disincentives that the organization presents to the development and implementation of the program.
- What are the main obstacles to enforcing sustainable practices within the company, from your point of view?
- What is the primary incentive for the organization, and for the industry, to implement sustainable practices?
- What are the main obstacles to enforcing sustainable practices within the wider industry, from your point of view?

Program Focus and Practice

Overall

- Overall, which of the following environment-related issues does the program address (add other examples to those provided)? In each of these categories, to what extent are environmental practices emphasized in daily operations (never, occasionally, usually, always)?

    a) Energy (conservation practices; alternative energy sources; transportation efficiency, emissions control, and carpooling).

    b) Indoor air quality (monitoring; control; building design).

    c) Impacts on natural habitats (maintenance of site locations; avoidance of sensitive habitats).

    d) Recycling and diversion of waste from landfills (type of waste recycled; reuse of materials; management of raw material consumption; and use of recycled materials).

    e) Water conservation (reuse of water; runoff treatment).

Energy and Atmosphere

- In the company, what are the major sources of energy employed in production?

- Are renewable energy resources available as alternatives, and if so, in what form and in what proportion?
- Does the company consider less-polluting and/or more-efficient manufacturers and subcontractors in forming business relationships?
- Are less polluting alternate transportation options employed (e.g., to transport people and equipment)?

Indoor Environmental Quality

- Does the company utilize cost saving and worker-efficiency strategies (e.g., natural ventilation versus air conditioning; day-lighting versus artificial lighting)?
- In construction and maintenance, both on and off-site, are non-toxic paints and other building materials employed to improve indoor air quality?

Sustainable Sites

- In selecting off-site locations, is consideration given to access to renewable energy resources, and to alternative means of efficient transportation?
- Are off-site locations monitored for environmental impacts related to business activities (e.g., protection of native species, trash control, toxic chemical, construction footprint)?

Materials and Resources

- In building construction and maintenance, are post-consumer recycled products and materials used?
- For off-site location construction and maintenance, are post-consumer recycled products and materials used?
- Are vendors chosen with consideration of material recycling and energy efficiency?
- What specific materials and resources are earmarked for recycling (e.g., film, scripts, sets, etc.)?

Water Efficiency

Is efficient water usage, and gray-water reuse, considered in production and operations?

Oil and Tire Management

- If you have a fleet or use vehicles, how do you manage your used oil?
- Do you have any programs that encourage used oil recycling, re-refined oil, or alternative fuels? If so, please describe.
- Do you have any tire management programs that advocate tire care, high mileage tires, or retreads? If so, please describe.
- Do you incorporate tire-derived products in construction of movie sets, temporary or permanent buildings?
- Do your purchasing policies encourage tire-derived products and/or re-refined oil?

- What incentive or what would it take for you to incorporate such practices/programs into your current business operations?
- Would you be willing to incorporate behavior modeling into a T.V. or movie script that sends the audience a used oil, tire management/recycling, and/or other environmental message?

Sustainable Practices Forum

- Would you participate in an industry-wide sustainable-practices forum?
- Which individuals in your organization should we contact regarding participation?
- Would you or your organization support the development of an industry-wide set of guidelines for implementing environmental practices within the industry?

Appendix C: Additional Resources

California Film Commission (CFC)

The CFC facilitates all aspects of the filmmaking process (including pre- and post-production) and helps in preventing filming problems from occurring. The CFC also assists in finding filming locations in California and issues permits for filming on state-owned property and manages incentive programs for filming in California.

Phone: 800-858-4749

Website: http://www.film.ca.gov

Email: filmca@film.ca.gov

CalMAX

CalMAX, the California Materials Exchange, is a free, state-sponsored on-line classified listing service. Post and search for available materials.

Phone: 1-877-520-9703

Email: calmax@ciwmb.ca.gov

Website: www.CalMAX.org

Earth Communications Office (ECO)

ECO is a non-profit organization that creates public service campaigns to educate and inspire people to create change to protect the planet with the help of those in the entertainment industry.

Address: Earth Communications Office

1526 14th Street, Suite 106

Santa Monica, CA 90404

Website: http://www.oneearth.org/

Email: info@oneearth.org

Environmental Media Association (EMA)

EMA is a non-profit organization that works with the entertainment industry in an effort to educate people about environmental issues.

Phone: (310) 446-6244

Email: ema@ema-online.org

Website: http://www.ema-online.org/

Film Liasons in California, Statewide (FLICS)

FLICS is a network of regional film offices and commissions that work cooperatively with the California Film Commission (CFC) to retain, attract and facilitate film production in California. FLICS welcomes project inquiries and offer variety of services to help expedite and assist productions.

Phone: 323-860-2960.

Website:
http://commerce.ca.gov/state/ttca/ttca_navigation.jsp?path=California+Film+Commission

Hollywood Recycles (formerly Recycling on Location)

Hollywood Recycles is a free beverage container recycling program for film and television productions filming on off-lot stages that are located within the Los Angeles area. Hollywood Recycles will deliver collection bins and collect them daily if on location or weekly when working on stage production.

Phone: 818-563-9111

Website: www.hollywoodrecycles.com

L.A. SHARES

L.A. SHARES is a non-profit materials exchange organization that benefits nonprofit organizations in Southern California. They will pick up reusable goods (new or used) from the local business community and distribute them to non-profit agencies and schools in Los Angeles.

Phone: 213-485-1097

Website: www.lashares.com

Email: Donate@lashares.org

Looney Bins

Looney Bins is a waste hauling company that serves the greater Los Angeles area. The company sorts and recycles co-mingled construction and demolition debris at its award winning facility. It also hauls unsorted debris from residential and commercial construction sites and processes it into reusable products and commodities.

Phone: 1-800 Looneybins (1-800-566-6392) or 1-818-768-7197

Website: http://www.looneybins.com/

Recycled-Content Product (RCP) Database

The RCP database is a state-sponsored database that lists thousands of products with recycled content and provides information on the companies that reprocess, manufacture, supply, and/or distribute these products.

Phone: (916) 341-6606

Website: http://www.ciwmb.ca.gov/RCP/

Email: RCP@ciwmb.ca.gov

Reuse Assistance Grants Program

The Reuse Assistance Grants Program is a cyclical and competitive program that was developed by the California Integrated Waste Management Board to provide the initiative and incentives for local public agencies to promote and apply the concept of reuse by developing or expanding reuse activities at the local public agency level.

Phone: 916-341-6613

Website: http://www.ciwmb.ca.gov/Reuse/Grants/

Email: sweimer@ciwmb.ca.gov

The ReUse People (TRP)

TRP is a non-profit corporation dedicated to deconstructing and salvaging building materials and distributing them for reuse. They have offices in San Diego, Orange/Los Angeles, and the San Francisco Bay Area.

Phone: 888-588-9490 or San Francisco Bay Area: 510-522-2722

Website: http://www.thereusepeople.org/

Email: Info@TheReusePeople.org

Appendix D: Existing Green Production Guidelines

This section contains extended excerpts from several existing "green production guidelines," such as those contained within the book *Low-Impact Filmmaking* (Fessenden and Ellenbogen 1991), and on the websites of the Environmental Media Association (EMA), and of the Entertainment Industry Development Corporation (EIDC).

We include these excerpts in order to provide the reader with a better understanding of the nature of these guidelines. We believe it is valuable to include these descriptions and excerpts as in particular the first two (the 1991 *Environmental Production Guide* by the AIPC and the 1991 book *Low-Impact Filmmaking* by Fessenden and Ellenbogen) are not widely distributed, and the EIDC and EMA guidelines do not appear to be as widely known as they deserve to be.

1991 Environmental Guide by the AIPC

This guide was produced as a grassroots effort by a few independent commercial producers. Only one edition was printed, it has not been updated or maintained since the original edition. The guide is organized into three areas: in the office, on the set, and on location. The guide is written in an informal anecdotal style, and while much of it is the inevitable checklist of basic good environmental practices, it includes some very detailed suggestions specific to the motion picture industry, for instance related to lighting arrangements that can reduce energy consumption and hence cost.

Low-Impact Filmmaking (Fessenden and Ellenbogen, 1991)[264]

This book contains suggestions related to various categories. With respect to paper, the authors' guidelines are to avoid using paper where possible, and to use recycled paper otherwise for scripts, office paper, business cards and other materials, and to recycle paper by providing bins in offices and on locations. They also suggest printing with soy-based ink, recycling printing cartridges, buying in bulk, and buying reusable products.

For the production office, their recommendations include to reduce heating, to use compact fluorescent light bulbs, less toxic cleaning supplies, to recycle office materials (including paper and plastic) by setting up a recycling facility that is easy to access and clearly identified and to donate surplus or out of date office materials.

With respect to locations, the authors recommend choosing locations with existing environmental services, and using existing environmental programs such as recycling and water conservation.

For transportation, they point to alternative fuel vehicles for cars, vans, and trucks. They also remind the reader to turn off engines rather than letting them idle and to maintain vehicles well, including checking brakes and keeping tires inflated at the right pressure. They suggest offering incentives to promote carpooling, public transport, or other alternative commuting methods.

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[264] *Low Impact Filmmaking: A Practical Guide to Environmentally Sound Film and Video Production*, Larry Fessenden and Michael Ellenbogen, available from Glass Eye Pix at http://www.glasseyepix.com/html/low.html, last accessed May 23, 2005.

For food services, the authors first recommend focusing on foods low on the food chain, and providing locally produced food, organic food and fresh fruits and vegetables. That includes serving organic and fair trade coffee. They also suggest serving foods in stages to allow donating excess food.[265] They call for reusable plates, cups and silverware, and prefer recycled paper plates over plastic when reusables are not available. They suggest giving the crew their own mugs with the film's logo and asking them to use it for beverages throughout the film.

The authors' recommendations for the art department include trying to use the least toxic material possible, using low-VOC paints, varnishes, solvents, etc., avoiding spray paint, properly disposing of waste, and donating excess materials or making sure they are properly disposed of in hazardous waste facilities.

Turning to grips and electricians, the authors recommend using an alternative fuel generator, and maintaining generators to allow them operate at maximum efficiency. They suggest using daylight where possible, and remind the readers to minimize use of expendables and batteries and to reuse (or recharge) them when possible and to dispose of them appropriately or donate them otherwise.

Finally, the authors point to the importance of education, including informing the crew about the environmental practices that apply during film production, and perhaps putting an interesting environmental fact on the call sheet each day.

EMA Standards and Green Seal Award Checklist[266]

The Environmental Media Association updated their green guidelines some time during 2004. It includes sections on "production offices and around the set," "green standards for characters," "how to make a production green," and the checklist for the Green Seal Award. The following summary has been condensed from the EMA website, where the discussion is categorized into green guidelines for production offices and sets, for characters, and for a production.[267]

For production offices and sets, the guidelines include many of the same suggestions as the *Low-Impact Filmmaking* book discussed above. Additional suggestions include[268] double-sided printing and copying, decorating offices with plants to improve indoor air quality, purchasing used office furniture, using Energy Star appliances, using organic cotton or recycled materials for logo T-shirts, and others. The category ends with the exhortation "...and of course, set an example for others and get them involved too!"

The EMA guidelines provide suggestions for behavior that characters can exhibit at home or in the office.[269] Environmental behaviors for characters at home include recycling, driving fuel-efficient cars, walking or carpooling, turning off lights when leaving rooms and not letting water run while brushing teeth, donating old household items to charities,

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[265] This was also recommended to us by CIWMB in organizing our second conference at UCLA, and indeed helped to allow the caterer to donate more food than would otherwise have been the case.
[266] See http://www.ema-online.org/what_you_can_do.htm for the green guidelines and http://www.ema-online.org/awards_green_seal.htm for the Green Seal checklist, last accessed May 22, 2005.
[267] This list is condensed from the EMA website at http://www.ema-online.org/what_you_can_do.htm#set, last accessed May 22, 2005.
[268] See the EMA website at http://www.ema-online.org/what_you_can_do.htm#set, for a more comprehensive list.
[269] This list is condensed from the EMA website at http://www.ema-online.org/what_you_can_do.htm#characters, last accessed May 22, 2005.

buying in bulk, using canvas shopping bags, putting food in reusable storage containers, etc. In the office, characters should recycle, use reusable kitchenware, use fuel-efficient cars or carpool, turn off lights and appliances, ensure that offices have natural lighting and plants, among other things.

EMA's recommendations to a production company[270] include asking vendors to provide generators, refrigerators and vehicles that run on alternative energy or that at least are fuel efficient, contracting with a recycling service, using energy-efficient appliances, recycling sets or donating set materials to local organizations, using a separate bin for wood waste, purchasing FSC certified wood products[271] and low-emission and less toxic chemicals and paints, purchasing green energy from the local utility, etc.

Finally, the checklist for the EMA Green Seal award asks applicants to rate their own production on a 5-point scale on the following dimensions:[272]

- "Use certified Renewable/Sustainable Building Materials for set construction, instead of endangered rainforest hardwood (Lauan).
- Use paints, sealants and lacquers that are low-emission (low VOC) and less toxic.
- Lease Hybrid and/or Electric vehicles for the production.
- Buy Clean Diesel (low sulfur diesel) from ARCO stations for all production generators and vehicles.
- Buy environmentally friendly products, with recycled content, for production offices (paper towels, plates, napkins, cups; office paper, pencils; t-shirts, etc.)
- Donate unused or unwanted production materials. (sets, paint and other supplies, props, office products, etc.)
- Recycle production office materials. (paper, plastics, glass, cans, cardboard, wood; VHS, Digital Betacams, DVDs, etc.)
- Make sure food/beverage suppliers & caterers utilize reusable or recyclable serving products, instead of Styrofoam."

EIDC Environmental Production Guide[273]

The Entertainment Industry Development Corporation (EIDC) maintains an environmental production guide, which was being updated as of May 22, 2005. The categories of green guidelines offered are the production office, on location (in progress at the time of writing), set construction, props, catering, lights and camera, and green purchasing. Many of the recommendations are similar to those included in the other green production guides already discussed; the EIDC site does include slightly more detailed explanation of the environmental aspect of some of the recommendations.

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[270] This list is condensed from the EMA website at http://www.ema-online.org/what_you_can_do.htm#production, last accessed May 22, 2005.
[271] FSC is the Forest Stewardship Council, see www.fscus.org.
[272] This list is taken verbatim from the Green Seal Award checklist available at the EMA website at http://www.ema-online.org/pdf/2005_ema_green_seal_entry.pdf, last accessed May 22, 2005.
[273] See http://www.eidc.com/epg/Env_Prod_Dept/env_prod_dept.html.

For the production office[274], the EIDC site addresses reducing paper consumption and increasing recycling of scripts and other supplies, donating materials after finishing a project, selecting non-toxic janitorial products, asking vendors to use reusable packaging for supplies, etc.

For set building,[275] the guidelines include avoiding tropical hardwoods such as luaun, using steel rather than wood scaffolding, avoiding non-water-based paint and donating leftover paint, using recycled materials for wallboard, and planning ahead to donate set materials when striking a set.

For props,[276] the guidelines suggest used props and donating props (e.g. through Hollywood CPR), and selecting props that send environmental messages such as drinking from reusable mugs, showing posters of environmental groups in kids' rooms, etc.

The section on catering[277] calls for organic food, making sure the menu includes vegetarian options, using reusable or recyclable containers, and donating leftover food to food banks (pointing to recent federal legislation that removes the potential liability associated with donating leftover food if it's donated in good faith).

[274] This list is taken verbatim from the EIDC Environmental Production Guide website at http://www.eidc.com/epg/Env_Prod_Dept/ALL_in_the_setup/all_in_the_setup.html, last accessed May 22, 2005.
[275] This list is taken verbatim from the EIDC Environmental Production Guide website at http://www.eidc.com/epg/Env_Prod_Dept/Big_buildup/big_buildup.html, last accessed May 22, 2005.
[276] This list is taken verbatim from the EIDC Environmental Production Guide website at http://www.eidc.com/epg/Env_Prod_Dept/Proper_props/proper_props.html, last accessed May 22, 2005.
[277] This list is taken verbatim from the EIDC Environmental Production Guide website at http://www.eidc.com/epg/Env_Prod_Dept/Ya_gotta_eat/ya_gotta_eat.html, last accessed May 22, 2005.

Appendix E: Environmental Articles in Industry Publications

The list below is the set of articles on environmental topics used in the analysis of reporting on environmental topics in *The Hollywood Reporter* and *Variety*, discussed above.

- August 12, 1991: *THR* reports on the nominations for the first EMA awards.
- November 25, 1991: *THR* reports that Fox will release two eco-themed animated features (*Ferngully* and *Once Upon a Forest*), insisting that packaging for licensed products also be environmentally correct.
- January 15, 1992: *THR* reports on the winners of the annual Genesis Awards honoring those who raise awareness of animal issues.
- January 15, 1992: *THR* reports that CBS will run a mini-series on a range of topics, including global warming.
- April 22, 1992: *THR* reports on the environmental fare being offered by the cable industry to celebrate Earth Day.
- July 24, 1992: *THR* reports on a briefing sponsored by EMA.
- September 15, 1992: *THR* reports that Jack Lemmon receives the first US Population Environment award.
- September 25, 1992: *THR* reports on the EMA award winners.
- January 7, 1993: *THR* reports that studios plan to recycle sets.
- February 23, 1993: *V* reports that Ed Begley Jr. hosts GGP's "Heroes of the Earth" special focusing on recipients of Goldman Environmental Prize, for Earth Day.
- April 15, 1993: *V* reports on President Clinton's meeting with the showbiz environmental crowd.
- April 19, 1993: *THR* reports on the Kids Earth Summit at Nickelodeon Studios.
- April 19, 1993: *THR* reports on Earth Day concert at the Hollywood Bowl, with Paul McCartney.
- April 22, 1993: *THR* reports that activists have persuaded record companies to replace the CD box by a "jewel" format and have started an initiative to replace lauan.
- April 22, 1993: *V* reports that Hollywood has made major steps in becoming greener but is still not the cleanest industry out there.
- April 22, 1993: *THR* reports on the HBO special "Earth and the American Dream" for Earth Day
- June 8, 1993: *V* reports on celebrities to receive Earth Day International awards.
- July 29, 1993: *THR* reports on an annual breakfast sponsored by EMA.

- September 23, 1993: *THR* reports on Vice-President Gore speaking at EMA awards.
- February 28, 1994: *THR* reports on special Oscars awarded for reducing the environmental impact of film processing.
- January 13, 1994: *V* reports on Steven Seagal's ecology-themed adventure "On Deadly Ground."
- April 20, 1994: *V* reports on various environmental fundraisers.
- May 13, 1994: *THR* reports that the Ecology Channel is scheduled for launch on December 6, 1994.
- July 5, 1994: *THR* on *Pacific Meltdown*, an ecology thriller with Russell Crowe.
- July 12, 1994: *THR* reports on EMA's first populations and consumption briefing.
- October 18, 1994: *THR* reports on the EMA awards.
- March 16, 1995: *THR* reports on ECO's public service announcement for the 25th anniversary of Earth Day.
- April 20, 1995: *THR* reports that EMA announces an online guide to aid industry with environmentalism.
- April 21, 1995: *THR* reports on an interview with Ed Begley Jr., in connection with Earth Day.
- July 14, 1995: *THR* reports on a breakfast speech by Robert Kennedy Jr. at annual EMA breakfast.
- November 22, 1995: *V* reports on 65 planned half-hour segments of Siegfried & Roy, in which kids will learn about conservation and ecology.
- December 22, 1995: *THR* reports that the Ecology Channel receives the lowest "survival quotient" score in *Cablevision.*
- April 29, 1996: *THR* reports on a "60 Minutes" piece on the dangers of pesticides, based largely on a report by NRDC.
- June 6, 1996: *V* reports on "The Magic 7" special for Earth Day, April 22, 1996.
- July 26, 1996: *THR* reports on a conference sponsored by EMA.
- June 17, 1997: *V* reports that Jeremy Thomas directs *All the Little Animals*, on issues of ecology and animal rights.
- November 4, 1997: *THR* reports on the EMA awards.
- November 25, 1997: *THR* provides a calendar of philanthropic events and description of groups.
- February 3, 1998: *THR* reports on marine life problems possibly related to leaking tanks while filming *Titanic.*
- March 12, 1998: *THR* reports on new series "Spaceship Earth" on the global ecology.

- July 21, 1998: *THR* reports that some in the industry dislike office locations in the San Fernando Valley due to air pollution.
- October 13, 1998: *THR* reports on the EMA awards.
- November 5, 1998: *THR* discusses the entertainment industry's defeat of a pollution tax credit program, which allows for funding of an in-state post-production tax credit.
- January 6, 1999: *V* reports that a Thai group threatens to sue Fox over environmental damage done during the filming of *The Beach*.
- May 12, 1999: *THR* reports on a lawsuit against Playa Vista developers building a facility for Dreamworks SKG over environmental objections.
- July 13, 1999: *THR* report on philanthropic efforts of celebrities, including Ted Turner's efforts on behalf of the environment.
- November 11, 1999: *V* reports on *Redwoods: The Trees of Mystery*, about a logger who develops new appreciation for ecology.
- March 9, 2000: *V* reports on celebrities visiting the Washington Mall for 30th Earth Day.
- April 14, 2000: *V* reports on DiCaprio's involvement in ABC's "Earth Day" special.
- June 1, 2000: *V* reports on "Earth to LA," a fundraiser for the NRDC.
- July 14, 2000: *THR* describes *The Sky's On Fire*, an ABC made-for-TV movie on global warming and the ozone layer.
- August 28, 2000: *V* announces a call for submissions for a wildlife film festival.
- October 17, 2000: *THR* reports on restrictions placed on producers of CBS show *Survivor*, filmed on ecologically sensitive land adjacent to Lumholtz National Park.
- December 8, 2000: *THR* reports on the EMA awards.
- December 12, 2000: *THR* reports on *Tuvalu*, a film about an island that will disappear if global warming continues.
- April 6, 2001: *THR* reports on *Butterfly*, documentary on environmental activist Julia Hill.
- April 10, 2001: *THR* discusses Ed Begley Jr.'s views on failure of electricity deregulation in California and resulting incentives to conserve energy.
- April 12, 2001: *V* reports that Morgan Freeman, Pearce Brosnan, and others are to star in an ECO public service announcement for Earth Day 2001.
- June 8, 2001: *THR* carries an interview with Brosnan and Shaye-Smith on environmentalism.
- November 9, 2001: *THR* reports on the EMA awards.
- February 26, 2002: *THR* report on "Earth to LA II" forum sponsored by the NRDC.
- April 19, 2002: *THR* report on PBS documentary on Ansel Adams for Earth Day.

- October 8, 2002: *THR* announces “Destination Earth” series on global warming.
- November 21, 2002: *THR* reports on the EMA awards.
- December 24, 2002: *THR* announces free Rolling Stones concert on global warming.
- December 31, 2002: *THR* quotes Robert Redford on ecology.
- April 21, 2003: *THR* discusses new Weather Channel show that will include global warming segment.
- July 18, 2003: *THR* reports that movie clients are asking for sustainable landscaping.
- July 23, 2003: *THR* carries article on environmentalist Dennis Weaver.
- July 23, 2003: *THR* describes several celebrities’ environmental causes.
- August 5, 2003: *THR* reports that several countries award tax credits because they believe the film industry is a “clean” industry.
- August 24, 2003: *V* reports on HBO executive Albrecht’s quest to preserve land in Santa Monica.
- September 29, 2003: *THR* reports on Woody Harrelson documentary *Go Further*, advocating a sustainable lifestyle.
- November 7, 2003: *THR* reports on the EMA awards.
- February 9, 2004: *V* reports on *Go Further*, on Woody Harrelson’s bio-fueled bus ride down the Pacific Coast Highway.
- March 11, 2004: *V* reports on new disposable DVDs with a mention of Disney’s recycling program to quiet concerns over environmental impact.
- April 22, 2004: *THR* reports that Disney is showing *Sacred Planet* for Earth Day.
- April 27, 2004: *V* reports that its environmental content generates publicity for *The Day After Tomorrow*.
- April 29, 2004: *THR* carries the director’s discussion of *The Day After Tomorrow*.
- May 5, 2004: *THR* also mentions the free publicity for *The Day After Tomorrow* due to its environmental content.
- May 12, 2004: *THR* reports on *The Day After Tomorrow* and environmental publicity.
- May 21, 2004: *THR* report on the NRDC Action Forum.
- May 21, 2004: *THR* reports how W3 architects use eco-design.
- May 27, 2004: *THR* article on *The Day After Tomorrow*.
- July 1, 2004: *THR* discusses *The Corporation*, including how carpet manufacturer Interface was restructured on sustainable principles.
- July 13, 2004: *THR* reports on environmental philanthropy in the industry.

- November 19, 2004: *THR* reports on the EMA awards.

Appendix F: Transcript and Images From GreenLight Discussions Forum (II)

This section contains selected transcripts from the event held on February 4, 2005 at the UCLA Anderson School of Management. An edited version of the event can be watched online; contact charles.corbett@anderson.ucla.edu for the web address.

Transcript

Note: this transcript was prepared by several members of the research team based on audiotapes of the event. The transcript has been lightly edited by the research team for fluency. Some of the speakers further reviewed and edited the text for accuracy, others did not. Any remaining errors or inaccuracies are the responsibility of the research team, for which we apologize.

Charles Corbett

Good Morning. Welcome to UCLA. I will be your host. Today's show will take you from the red carpets to Green Production passing through exotic places such as San Diego, Burbank, the Bay Area, Idaho and New Zealand.

Our event today is a joint production of a number of different organizations: the UCLA Institute of the Environment, the UCLA Anderson School of Management, the UCLA School of Theater Film and Television, and the California Integrated Waste Management Board. I would like to ask the representatives from these different groups to offer us a few words of welcome.

First of all, I would like to invite up Mary Nichols, the Director of the Institute of Environment.

Mary Nichols

Thank you Charles. Today will be an interesting day. The UCLA Institute of the Environment where I have been for a year now, brings people together to work on environmental problems from a cross-disciplinary perspective. It brings together scientists, policy people, lawyers, public health advocates and others. We develop projects and courses for our graduate students and are in the process of developing a new curriculum for undergraduates. We are also working on a bunch of new research projects. It is a really exciting place to be.

For this current and ongoing project, my contribution was lending my name to the great work that Charles and the students were already doing. This project is an example of the kind of partnership that we are looking to foster. Since there are global issues involved, there is a real need for the industry in the LA area to get together to develop and share practices. There are some leading lights though, people that have been working in this area for a really long time, and you will be hearing from many of them today.

I hope this is the first of many similar projects we will be working on together.

Thank you for being here.

Bruce Willison

Thank you very much. I'm very pleased to provide the decani imprimatur to today's session, which means we are approaching this in a very erudite academic manner.

This gathering highlights three major trends:

First, the increasing trend of the entertainment industry (particularly the motion picture industry) to utilize best management practices with a business focus. We are a school that has 1000 alumni who are in the entertainment industry, we get to see and hear about this all the time.

Secondly, a trend in the academic sphere, especially at Anderson, for academic research in the entertainment industry and in issues related to the environment. Business Week ranked our business school # 1 in the United States in terms of intellectual capital. To have our faculty participate in the research of both industries is really important.

Thirdly, an increasingly interdisciplinary approach to the problem being discussed today. It is not a management issue, it is not a legal issue, and it is not just scientific issues but all of these things working together.

We increasingly have our faculty working and building bridges with the private sector regarding these issues. The opportunity to come together to study these issues and move forward with solutions coupled with a very strong student interest in both entertainment and the entire area of social responsibility is great. It is with this spirit that we welcome you here today and hope you have a productive session. Thank you.

Barbara Boyle

Thank you Charles. First, I come from a world of fiction and not reality. Mary Nichols is the person who got me involved in this because my daughter-in-law is an environmental lawyer and a friend of Mary's. When I first met Mary, she took my hand, asked me to be involved in this and did not let go of my hand until she introduced me to Charles Corbett.

I was passed along in the most slick and sophisticated way. Charles wrote me an e-mail, talking about sustainability in the motion picture industry, and I pondered this. I answered him, "motion pictures are really not economically viable any more from just their theatrical revenues." Charles wrote back and said, "sustainability means something else in the environmental world. We are not questioning whether motion pictures themselves are economically viable, but rather the impact of the motion picture industry on the environment." He got me thinking of how my make-believe images influence the world, how people watch television and film and every other kind of device, however they are shot or distributed. And the world right now is talking about how America is portrayed and how it is recognized, criticized and evaluated because of those moving images. So now you think of what you can do as artists, as film artists, as any artists, to show how films are important for the environment. This is not a question of tomorrow, but a question of today.

The school, I, and my students who are filming this are all delighted to be a part of this really important conference. Thank you.

Terry Tamminen (videotaped message)

Hello, on behalf of the Governor, we would like to thank you for coming together today to discuss the issue of Environmental Sustainability in the Motion Picture and Television Industry.

I'm actually very impressed by the amount of work that has already gone on. Previously, I served as the Secretary of the California Environmental Protection Agency which includes our Integrated Waste Management Board. I know how much work has been done to reduce things like waste and the VOCs from paint used on sets in the motion pictures industry. I've actually seen and made loans through our Integrated Waste Management Board to companies like Looney Bins that actually takes television and movie sets and breaks down their component parts so that the wood can be used again and recycled. A lot of work has been done. The major studios have made sure that scripts are copied on two sides, water usage has been reduced, ride sharing and so forth. But there is always more we can do and when people come together that is usually how they find solutions.

The Governor and I really appreciate the work that you are doing, We look forward to hearing the outcomes of your discussion, to continuing to work with you, and to using government services to help you as much as possible. Obviously, this is the industry that is dear to the Governor's heart but his environmental agendas are also dear to his heart. So he loves it when things come together. As he would say, "Fantastic!"

I know that you are going to be successful as you address these issues today and in the future. I know it because there is a real spirit of can do in the motion picture and television industry in this state. It is obviously one of the most important and a lot of our valuable volunteers come from all walks of life from this industry. Whether you are an actor, a movie executive, a producer or whatever part of the television or movie business that you are in, you are probably one of those volunteers that helps your community in many ways.

There is no better way to address sustainability. To put it another way, Shakespeare said, "Nature's bequest gives nothing but doth lend. Then how, when Nature calls thee to be gone, what acceptable audit canst thou leave?" Well, I think a very acceptable audit or legacy would be to have a truly sustainable agenda in the motion picture industry in California. Thank you.

Ed Begley Jr.

Thank you all for coming. I'm happy to be here. Thank you, especially Mary Nichols. She and I have been serving on the Clean Air Coalition for years now, talking about the usual suspects and finding ourselves in battles and gains over the years.

It's important to remind ourselves what we have gained because when you talk about the problem, you can get into a kind of spiral about it and start thinking about how there is no hope and "what's the point?" You start watching it at home on your big screen TV and see so many big problems such as climate change and how you can't make an impact. But that is surely not the case.

Mary and I can tell you about the Coalition for Clean Air and the American Lung Association, who is here represented by Andy and many other people. These wonder people banded together a long time ago, some 30-odd years or so, and decided, as I did in 1970, enough already with this horrible smokey-smog.

Anyone else born in LA or been here for many years? I've been here since 1949. I was born here, and I remember this horrible choking smog in the Valley and throughout LA. You could not see the Santa Monica Mountain from the middle of the Valley; you could not see the Simi Hills. This is how it was in the mid 50's and 60's on most days. It would rain and the winds would blow, and you would see those hills some thirty days a year and the rest was horrible choking smog. And you could not, as a young kid, run without wheezing or breathing hard. I was not then or now an asthmatic, but there are many who are. And people said, "Enough."

I can report to you now, since the 1970's, there are four times the amount of cars (which is not good news), yet we have half the ozone. How did we do that? We did that through all of the stuff that people said would drive California to the brink of bankruptcy: clean air regulation, catalytic converters, stationary source reduction, removing VOC's from paint, all these big and little plays, we came together and made it work. It worked. We have much cleaner air than the 1970s.

But that's not it. We can't rest on our laurels. We can't say, "Wow, good job!" We have to continue to work and that's what we are doing. We are continuing to work to make it better. That's what they are doing here at UCLA's Institute of the Environment: showing the common sense in a solution that makes it work in the business sense where you make money.

It always kills me to hear people complain about the amount of money used to implement a protocol (or any other environmental regulation) – it is the same thing we have been hearing for years about catalytic converters, and stationary source reduction: "We're going to go broke doing it." Forgetting that there are jobs created doing these things: jobs making hybrid cars, jobs making electric cars, jobs making natural gases or biodiesel vehicles, jobs making compact fluorescent bulbs, energy-saving thermostats, and double pane windows. These are jobs too.

If you let one industry decide the way things are going to go, that industry will be the oil and coal industry. They want to hold on to what they have, and I understand that. But you have to move into another direction so that other industries will prosper as they have in California.

Having said all that, what does this have to do with motion pictures and entertainment? A great deal. This is about giving an alternative message about eco-homes and more simple living. This is about the long history we have with Busby Berkeley movies (and many others) where excess has been celebrated. Excess was the way to go. And most recently, shows where champagne and caviar are wishes and the lifestyles of the rich and famous are drama. They celebrate excess and that message is transmitted around the world with satellite technology. People all over the world want to live like "Dallas" and "Dynasty" because that is the way America lives. We figured out that's a problem. Not to suggest that it's wrong. This is a free country. To celebrate success, you should have a big house if you want a big house, but there is a way to have all these things, to have a cold beverage and a warm shower and to do it efficiently. And that's what we are trying to promote. And that is what this is about.

The motion picture industry has been guilty of great excess on screen and off screen. Paper scripts thrown away, perfectly good 2 x 4's, 1 x 3's, large pieces of lumber thrown in dumpsters. But that has changed. We have people to thank like Brett at Disney, and Gretchen from 20th Century Fox for making a change and moving into another direction where material is reused.

The irony did not escape me or the press when we had a big rainforest benefit on a sound stage in the 1990's, "Save the rainforest!" Finally someone asked, "How many board feet have been used in the history of this particular sound stage where they are holding the benefit tonight?" Silence. The fact is that particular sound stage where we had the rainforest benefit was responsible for destroying 4,000 hectares of rainforest luan. That one sound stage over the years. Luan is cheap, use it for the sound stage, paint over it, throw it away, and put it in the dumpster. That was the way.

We've gone on in a different direction as Mary is showing us. We have tried to demonstrate over the years "a dollar and cents" approach. I've been in this since the 1970's. I started recycling, doing all these things. In the1990's, I moved into a 1936 house, decided to do a retrofit and to do what I could in a very common sense approach. I did all these things for the love of it and for the environment. I had no idea at the time that it would have such a dollar and cents benefit over the years.

What I always urge people to do is pick the low hanging fruit first. It's wonderful to want solar and electric cars – I have both. But pick the low hanging fruit first; don't get all "I have to do everything today." You drive yourself crazy trying to build a whole system the way I did. Do the common-sense approach that makes good business sense today: compact fluorescent bulbs, energy-saving thermostat, and good insulation.

What can they do on a sound stage, or a movie lot, that is a common sense approach? They can start collecting the white paper, mixed papers, and cardboard, and do it in an efficient manner where it makes sense for the studio and does not hemorrhage money. It comes down to the nuts and bolts stuff.

You have to have someone who is responsible, someone who is overseeing it, someone who is on the set. The crafts services person: do they have time to do it? Is it going to be another person who is going to do it? Who is going to collect the recyclables? How does it actually work? It's great in theory. What are the nuts and bolts of it?

Now finally with set re-use. We are going to hear from the people from Reuse today. I just saw this CalMAX thing: available materials, wanted materials? It's terrific. All this stuff you can get, doing a low budget movie or any budget movie. You can get this stuff. Prop guys want 90 percent of the stuff I see in this book here. It's available material. This should be widely disseminated material, and I hope it is available.

I also want to take a little bit of pride in, not just the Coalition of Clean Air and Mary (and others that have helped clean air), but also EMA, the Environmental Media Association. We try to interface or act as a liaison between the entertainment industry and the environmental community to tell people how they can clean up their act environmentally. Gretchen has been there for 20th and Brett for Disney. We have tried to show the way that they can do it. It's great to suggest. For example, I hope you get all those generators the movie groups are using and run them on biodiesel. It's a great idea. But what are the nuts and bolts of that, how is that going to happen, how are they going to get biodesel on the set they are shooting in Azusa? How are they going to get it out there? Are there teams, transportation captains? What are the nuts and bolts of this stuff and how does it work? I believe it can work. But we have to make sure we have common sense deadlines: what can we do, and when can we do it?

I want to say, you have to be careful of being too shrill sometimes. I know I had a reputation of being an "in-your-face" kind of guy, kind of an environmentalist, kind of a gorilla fighter. I've been an activist certainly. On a set in 1992, a very frightened assistant

director came to me and put a little ear piece in. “Ed can I talk to you for a minute?” “Sure Bill, what’s the matter?” “We got a little problem.” “Did anyone get hurt?” “No, no, can I sit for a minute? We have a shot tonight, but we haven’t been able to find an electric station wagon.” He thought I wouldn’t sit in a regular station wagon. Another time, people were afraid I was going to walk off the set, because they didn’t have a recycling bin. I guess people know that there are many serious people out there, but ultimately it comes down to who’s going to handle it, who’s going to lug the glass bottles or aluminum cans, whatever it is? Who is going to do it, the crafts services guy? Is he going to have time? You got to find the money, you got to find the time, you got to find the common sense approach and that’s what you are going to hear in great detail from the people at Reuse, including Brett and Gretchen and all the other people that have been on the ground doing this. I believe it can be done, and I’m so proud to be a part of this today. Thank you very much.

Charles Corbett

The research team will give a broad overview of the last year and a half. It is impossible to summarize the efforts of the last year and a half by a dozen people in the next 15 minutes. You can see this as an extended commercial for the research report and documentary that we will be producing. (There will be an edited version of this event and a small documentary based on the broader theme of sustainability in the motion picture industry that will be made available through the website later.)

I will spend a few minutes discussing the broad overview. We will focus on the things we learned, especially since most of the researchers are outsiders in this industry. What are some of the interesting or surprising findings we have found in this process? We are going to share a few of those with you before we transition to Jason McLennan who will give us a perspective on green building and how that applies to the motion picture industry.

I want to say that we tried to be complete in our acknowledgement of people in the program. But we do have a fairly extensive research team that has been involved in this.

On the website, there is a statement from Terry Tamminen and strong support from the Governor’s office. If you would like to read exactly what he said, I’ll be happy to put it on the website. But just very loosely, about two years ago, there was some initial discussion between UCLA and the Institute of the Environment. At that time Professor Turco was the Director of the Institute of the Environment, and the Waste Management Board wanted to do a study on sustainability in the motion picture industry.

Of course you may wonder why you would want to focus on the motion picture industry if you are interested in sustainability and environmental issues. Why not focus on industries that seem dirty? There were really a number of different thoughts that went into that decision. One of them being that the motion picture industry is (of course), a big presence in California, and therefore, it’s worth looking at it for that reason alone.

Another reason is that it is an extremely visible and influential industry so whatever good practices we can find and learn from are much more likely to be applied to other industries. The apparel industry in comparison is a big industry in downtown LA, but it is a big industry that most people don’t know about and probably don’t really care about too much.

The third reason is that the motion picture industry is now often seen as a model towards which many other industries are converging. If you think of manufacturing as say Ford in

the early 1900's making the Ford in a very big production line, it is very different from what we see in the motion picture industry. The way many companies, many industries are evolving now in the west, they are more and more becoming networks of smaller companies. Many activities are outsourced every time a new product is created (whether it's a new aircraft or a new submarine or a new satellite, or a new toy, or a new fashion garment.) It's a new network of people being put together for a particular purpose for a short period and then it expires to do something else.

When you look at that model, the way many industries are evolving, you realize that it looks suspiciously like the motion picture industry, which has been operating like this for its entire existence. So it makes good sense to think about and figure out how we determine sustainability and environmental impacts in the motion picture industry because many other industries will be heading there. We can learn a lot from the good practices that have already been put in place in the motion picture industry.

So those are the thoughts behind why it makes a lot more sense to pick this industry as a focal point for study than it might appear at first glance. Over the last year and a half there have been a lot of angles in the research, including many interviews with people from many different areas and functions within the industry. We found a number of interesting, surprising, and enjoyably impressive findings. We came as a group of outsiders from the business school, the environmental community, people from the school of architecture, the school of urban planning, public policy and film school. A lot of us were not familiar with how the movie industry worked, but a lot of learning was done.

What we found that there is an unbelievable level of strong personal commitment among many individuals in the motion picture industry towards sustainability, towards reducing environmental impact, towards social responsibility, quite possibly more than any other industry you can imagine. You see quotes such as "leave no footprint when shooting on location." Many location managers are actually passionate about it, we will hear about this later today. There are many people that work as environmental managers at studios who are far, far ahead of what happens in other industries. Sometimes it doesn't get outside publicity, but there are wonderful things happening inside the studios.

That was very impressive to learn about and at the same time, like many industries, there is room for further improvement. Particularly there is a notion that the industry is a very clean industry. In many ways this is very true but there are a few other twists to it that are often not visible but have a very substantial impact. The inevitable one that everyone is familiar with is "the throw away" mentality (although I shouldn't call it that) – it is when there is such a hurry to get rid of things, but no time to do it right. Yet, many other industries face it and get around it. (*Insert Powerpoint figure per Professor Corbett.*)

This is one piece of good news: this is a trend of how the industry talks to itself about environmental issues and sustainability. We did a simple analysis. We looked at the Hollywood Reporter and Variety, two of the main publications in the industry. How many articles have there been since the 1990's that really focus on environmental topics? You can see that in 1990-1991 there was a huge spike of interest and then a leveling off. But now you can see the interest surge. So for anyone interested in the field this is phenomenally good news. There is a huge resurgence and interest in activity in this area.

It is no coincidence that in 1990-91 there was a spike because it just started. If you look back at the history, you see a lot of things happening during this time. Thus, this trend reflects action. Here is one chart that shows that, "yes," this trend has been reflected in

action. (*Insert Powerpoint slide per Professor Corbett.*) This study released by the Motion Picture Association of America some time ago, looked at how much waste had been diverted from landfills by the studios. You look at the chart and see the amount of waste go up and think it's a bad thing, but remember this is the diversion of waste. This is waste that is kept out of landfills. Higher numbers are better numbers. So, what we see is indeed not a result of legal pressure but entirely voluntary initiatives within the studios. You can see a very impressive trend of keeping waste out of landfills from almost nothing to a substantial amount in the last few years. This is completely voluntary, so you can see it does indeed reflect an increasing awareness and interest within the industry.

When you try to measure how big the impact is of the industry, you can do that in a number of different ways. You can say, "Let's define the industry just as the industry itself." You can say that it is 7 or 8 studios with surrounding services, but this is a narrow view of it. Typically, you want to know, "What is the total impact of the industry, the total economic and environmental impact of it?" We should take a slightly broader perspective because the industry itself requires many inputs, from many other industries such as caterers, transportation companies, utilities, steel companies, material providers etc. All of these are linked to the motion picture industry. Those suppliers of services also have their suppliers of products and services, etc. So when people in the environmental community look at what is the environmental impact associated with an industry, we try to tease out the first, second, third, and fourth order impact and add them all up and then show what the total footprint of the industry is.

I tried to do that with help from a few others, including David Rigby from the Geography Department. We tried to do that for a number of different industries. We picked four: petroleum refining, semi-conductors, hotels, and the motion picture industry. We looked at conventional pollutants, the aggregate measure of air pollution, and the kinds of things that cause smog in LA. Well, petroleum refining (no surprise to anyone) did not fit in the chart; it's a very major contributor to air pollution. Semi-conductors are often thought of as a relatively clean manufacturing industry, and in comparison to petroleum refining, it is a very clean industry. (It releases around a half million metric tons of pollutants.) The hotel industry (which people don't often think of as a polluting industry), if you add up all of the hotels in California alone, if you add up all the pollution caused by hotels plus surrounding economic activities, it's about three-quarters of a million tons of pollutants.

How does the motion picture industry compare to that? In a way, it is good news. It is not nearly as bad as petroleum refining. But you might be surprised to see that we are looking at the same order of magnitude of pollutants as found in other industries (such as the entire hotel industry or semi-conductor manufacturing in California.) It's actually a noticeable impact, and it's the same story if you look at greenhouse gas emissions which have attracted a lot of attention recently due to the role they play in climate change and global warming. (The "Day After Tomorrow" is probably the biggest single agent to bring attention to greenhouse gases and global warming both inside and outside the industry.) Petroleum refining is a major contributor of these gases, semi-conductors a little lesser of one, and hotels a little more than semi-conductors. Motion pictures are comparable to semi-conductors and hotels in terms of their contribution to global warming.

Yet, there is, of course, a big difference between the motion picture industry and, for instance, semi-conductors. You wonder what the motion picture industry can possibly do that has any pollution or greenhouse gas emissions associated with it. The answer is simple: size. You take an industry with seven hundred thousand people that have offices,

build sets or costumes, travel, commute, use paper, live in buildings, have lighting, air conditioning, all of these things. Multiplied by seven hundred thousand people, these activities start to add up. This is very different from the profile of the semiconductor industry, for example, where there are a few clear point sources, a few manufacturing plants that have a major impact, and beyond that there is not much going on.

I look at that as very good news though. If you think about it: if you work at a semi-conductor factory and are not actually involved in production, there is not much you can do as an individual to reduce emissions. In the semi-conductor industry only a few people in the entire industry have any meaningful impact on the release of pollutants and greenhouse gases. However in the motion picture industry, where there is a combination of many thousand impacts, people making little changes together can cause a very substantial change in the impact of the industry. This is the message that Ed Begley was giving us too. What each of us does individually makes a difference. All these differences together add up and are noticeable at the state level.

So what do we conclude from that? It is a clean industry, if you look at impact per employee for instance. It's obviously a lot lower than many other industries out there. But simply due to the sheer size and visibility of the industry, there is actually the potential of reducing that impact even further.

So what are people already doing in the industry to address this? There are many examples today in many areas. There are valuable groups such as ECIO or EMA (and others as well), and there are many examples of better production practices within each industry that we will hear later on today, but let me give you one or two examples of these practices that some of you should be familiar with.

On the TV show "According to Jim," one of the executive producers, Jeffrey Hodes, decided last year to stop wasting paper for scripts. A person on the show usually gets several versions of the script each day because it keeps getting changed. They now use tablet PCs because it is wireless, you see all the changes, and you accept or reject, which sounds great. Writers might initially have a problem, but you save a quarter of a million sheets of paper per season so it's certainly worth doing. What's more valuable is that they save more than half an hour of production time every day because they don't have to run to the copying machine and make thirty copies. Because time is money, saving half an hour on a tight production schedule is worth a lot more than saving a quarter of a million sheets of paper. It just so happened that when they did this they were concerned about saving paper, and they ended up saving more than paper.

Remember what Ed Begley said earlier, that in the 1970's he started with a personal commitment to the environment? He didn't know how many dollars and cents he would save. Once again, if you do this for the right reasons, you end up getting many more benefits than you expected.

Here's another example you will hear a lot more about later on today by Ted Reiff, about how the set for the "Matrix" was reused. Many of you have seen the movie, and of course, these were humongous sets. Almost all those materials were actually salvaged, taken back, reused and recycled. You heard about the "Day After Tomorrow," Emmerich and his partner purposely purchased carbon offsets, meaning that enough trees were planted to more than compensate for the carbon dioxide caused by the production of the movie. They paid for this out of their own pockets. It does help a lot; it offsets all of the carbon dioxide emissions. But what is also happening is that they are starting to measure what causes these emissions in the first place and the long term effects of reducing the

emissions. Once you start measuring, things tend to get lower automatically, so that is really the long term benefit. It is a clear example of the leaders of the production taking the initiative to do something. Once you start to do something, things change automatically. These people are all starting to do this in their future productions - it's not just a one time isolated story, it is an ongoing phenomenon.

There are a number of guidelines of what a Green Production looks like. These are the three main ones that we have come across during the course of the study. There is one that was put out in 1991. There are two others that are up to date and maintained well. There is an EIDC environmental website that has detailed information on what people should do in the office and on location in terms of purchasing from vendors, lighting, etc. The other one was revamped last year by EMA, and they launched the Green Seal Award. The EMA Award ceremony has a separate award specifically for the production that best adhered to the Green Production Guidelines.

You might ask what is happening in other industries. Well, the Green Production Guide pertains to the movie industry, but standards of some kind or other are very common. The LEED in the green building industry is well known, and several of the team are LEED certified auditors. LEED is a standard for making buildings environmentally sustainable, and it involves many things. You can imagine the standards in architecture five or ten years ago – architects don't design buildings in sustainable ways if that limits their creative freedom. Today, LEED certification is the hottest thing in the entire industry. It's changed in the space of three to four years. Once the momentum starts rolling, once the demand is there, you cannot get enough LEED auditors to evaluate the project, and architects are still concerned with creativity and freedom. They found a way to blend the two.

Another common standard, ISO 14000, is typically associated with the manufacturing industry but is widely applied to many industries around the world. There are about 65,000 companies that have this environmental management standard. Some people say it's wonderful, others are skeptical. In fact, Sony as a company pursued a world wide certification effort so that Sony Studios in LA and Culver City are certified to ISO 14000.

But even if you don't necessarily know what the standard is or attach value to it, you should look at what's happening in other industries. For instance, the standard was released in 1996, and a company like IBM with no legal obligation to do so, started sending letters to all of their suppliers that said, "IBM has a long standing commitment to environmental leadership around the world." As a supplier, it makes you feel wonderful about the IBM family. But just as you are being lulled into a sense of comfort, it says "IBM encourages you to align your management system with the requirements of ISO 14000 and to pursue registration under this standard."

If you were a supplier to IBM and got a letter to encourage you to do something, you can only imagine what it does. There is no legal requirement to get the standard. IBM spent a lot of money to get the certification without any obligation to do so, and they pushed many of their suppliers, again, taking a leadership role. Many other companies are doing exactly the same thing. They are trying to impose better practices through their purchasing power, their visibility, and their corporate power through the entire world.

So what is our dream then? We would love it, if somehow in the near future, that every production of a television show, or motion picture, or other similar project, starts to measure what its environmental impacts are and becomes conscious of the effects they are causing, the number of office buildings they are using, the number of flights people

are taking, the number of caterers and other services they are using. Just start to measure that and over-night the number will start dropping without any investment whatsoever. Wouldn't it be great after researching the situation and using a checklist, to earn a Green Certification? Many people for example talk about animal rights. You can do anything you want with animals, but if you follow the appropriate regulations, at the end of the movie it says, "During the production of this movie no animals were harmed." Wouldn't it be great to have an environmental seal at the end of the movie saying, "During the production of this movie, no environmental impacts were created." That is what we can achieve, and a huge amount of good work has already been put in to get us there.

So how can we actually get there? We are wrapping up the research effort as we speak. But we would love to speak to you and get a few more examples of environmental best practices. We are also looking for opportunities to do a detailed analysis of the environmental impact of a particular production. We are looking for case studies. We already have some leads.

I would now like to transition to our next speaker who can talk about how Green Building applies to the motion picture industry: Jason McLennan.

Jason McLennan

(Text omitted)

Brett Rohring

(Not taped per Disney company policy.)

Gretchen Lewotsky

First of all, I would like to thank Brett for leaving me behind him after that video. It's kind of hard to follow up after a company like Disney. It's massive, and they are doing an incredible job. I, on the other hand, represent a studio. Therefore, I am representing a smaller perspective.

I do want to make a couple of housekeeping statements. I am speaking here as a person and an individual, although I do work at FOX, and I am an officer of the company. These are my opinions, and FOX is not accountable or responsible for them. I am trying to represent everything accurately, but please understand, it is coming out of my mouth and not the studio's.

The second thing is that you will be hearing a lot about the wonderful staff we have at Fox. We have a great environmental team, and it is incredible that so many of them are here. I want to introduce them. There is Donald Ishihara, who has been at the company for ten years now, and he is the Manager of Environmental Operations. John Moore is the Director of Environmental Health and Safety. Frank Litchauer is the Vice President of Environmental Health and Safety. Mona Strassburger is in our State and Local Government Affairs office, and she handles all of our contributions. Heather Priek handles all of our donations. We have a good team, and they all work together on all of these projects.

When Charles asked me to speak today, I asked him, "Do I have anything relevant to say?" I have been doing this for a long time. I have been at FOX for twenty years, and at least ten years of that time, if not more, has been spent working on environmental endeavors. Charles assured me that I had something relevant to say. So, what I would like

to share with you is how we work on a day-to-day basis, in the studio, how we get projects through, and on an overall basis, what the entertainment industry does.

The term “entertainment industry” in the environmental field is primarily seven major studios: Warner Brothers, Sony, Paramount, FOX, MGM, Universal and Disney. When I talk about the industry or the studios, this is what I am primarily talking about. A study that the motion picture industry did in 1998 showed that there were 4,496 entertainment companies with under four employees and there were only sixteen that had more than 1,000. There are a massive amount of people who consider themselves in the entertainment business. When you look at it, making pictures, making commercials, it is kind of a struggle to define this industry. People making games now consider themselves in the “entertainment” business. It is a very fuzzy area.

Many of you here have been involved in the Greening of Hollywood for many, many years. However, many of you haven’t, so I would like to share some background information to get you to where we are today and the commitment some of the major studios have to the environment.

Back in 1989, in California, Assembly Bill 939 proposed that all municipalities divert 25 percent of their waste stream by 1995 and 50 percent by the year 2000. The new director of Waste Management, who was brought out from New York, approached the seven major studios through the MPAA (the Motion Picture Association) and asked us if we wanted to be a prototype industry group. Recent legislation required that she met her goal so she was going to use her pressure on the industry to make sure it happened. Participation consisted primarily of various waste stream analyses, questionnaires, and most importantly, sharing the information in a city public report. We were willing to expose ourselves, and all the companies agreed.

If you know the entertainment industry, what we fear or hate most (besides another entertainment industry) is government regulation. Each of the studios selected a representative for a Solid Waste Task Force. We used our 1990 diversion statistics as a baseline (which was very low because no one had thought to record them before.). We started from there, and we agreed to collaborate on implementing recycling programs that catered to our unique business.

Our business is very unique in that we make movies, and we don’t make a widget. Yet, we are consistent. We consistently manufacture the same thing. We make sets and make movies, we get rid of sets and get rid of movies, we are a facility, we are a small city. We have everything in our studio lot that a city has. But we are unique and cater to our specific needs. We cater to different hours of operation or the types of waste streams we have. For instance, we have a whole bunch of baby dolls left over from a movie we made. How do we recycle those? We were going to use CalMAX. We were trying to show the productions that we could get rid of their waste streams. This was the first example they gave us. This was a tough one, but we managed to get back on track. That is the question: how do you deal with a dumpster full of baby dolls? It is not easy.

We had to look for programs and system that adhere to our unique business types. We have all types and classifications of waste streams. As most of you who are studio people know, we have multiple restaurants, a gas station, a power plant, a security fleet, a fleet of vehicles, an office building, a parking structure, hospitals and thousands and thousands of employees. And every one of those areas in the last twenty years has been regulated by the state or local or federal government. We had to take detailed inventory and document the compliance reports for all these programs. Starting these programs from nothing and

staying enrolled for the last twenty years has really been a phenomenal task because we really didn't have staff for it. It just became a part of people's jobs. It was people who were doing their jobs and something environmental.

I think Brett mentioned that it is their policy that every nook and cranny start with an environmental mentality. It's true. The task force began to meet monthly and shared successes and failures, and we continued to collaborate on industry policies and to report our diversion numbers (which I'm proud to say either met or exceeded the city's goals.) We were competitive about the garbage. FOX's programs took off, we expanded the diversion program. We included bottles, cans, plastics, fluorescent tubes, lead and alkaline batteries, paint, oils, food, film, video-tape, toners and all types of paper. None of these things were mandatory. That was something that our environmental team took to management, and they said it was a good thing to do, although it cost us a little more. It was really great to do that on a voluntary basis.

We also developed some other programs, including the Reuse Program. This program diverts furniture and props and office supplies to hundreds and hundreds of the 25,000 non-profits in the LA area. The 1990s was an exciting time for our programs and for recycling. FOX diversion statistics went from zero to a high of 83 percent in 1990. We continued to expand our program. For example, we were the first to install the internet to allow paperless corporate communication. From 1993-2001, FOX continually received a WRAP Award from the California Integrated Waste Management Board for creating new and innovating recycling projects.

We volunteer and implement extensive programs and offer statistics for public consumption. As an industry that is neither directly involved nor regulated by the Waste Business, we are happy to share our success with interested parties. Unlike car manufacturers, petroleum companies, and other highly competitive industries, the seven studios consistently participate with local environmental organizations, both through charitable contributions and board participation. We have all been honored or singled out by organizations such as Heal the Bay, TreePeople, EMA, Friends of the LA River, Clean Air Coalition, California League of Conservation Voters, the LA League of Conservation Voters and others.

If you are interested in working in the entertainment industry and in the environment, changing a corporate culture can be an incredible rewarding endeavor. But know this, it does not happen overnight. Our business is making movies and making television shows. We invest huge sums of money in very risky ventures with a hope of a profitable return. This is what we do. This is our core business. If we can't do that, we're not going to be able to implement environmental programs. Companies like Patagonia, which is stellar, were founded on an attention to environmental detail in every nook and cranny. But for people that are trying to turn our companies, it's like turning the Titanic. It's a huge operation with only two ways to do it, either through regulatory compliance and forcing and scaring them to it or through practicing good business. If we cannot show it to be a good business practice, there is no point in this.

Environmental programs or capital improvement proposals need to have an advocate to shuffle them through the budgeting and financial tug of wars. Let's be serious, it doesn't come from the chairman, the president or the CFO. These ideas come from the environmental operations person or a concerned department head. These are the people that push through a project, and it can tip or sail depending on the delicate balance of financial priorities and personal interest.

The advocate must make sure that the environmental impact and the costs and benefits are included in the input to the financial analyst. One of the major selling points of our online phone directory in the late 1990's was the savings that resulted from discontinuing the quarterly printing of our directory as well as the consideration of a reduced waste stream. The same was true for our on-lot e-mail system. Suspending the distribution of hard copies of lot-wide messages showed a financial benefit from not buying the paper, printing and distributing 3,000 memos. But that consideration was off-set by the lost revenues of the print shop. In the end, the electronic mail distribution plan won out. Each time you change a program, you impact the income or expenses in a department and you can impact someone's job, and trust me, people take their jobs seriously.

Changing processes can also be an important part of a studio's program. Buying 30 percent post-consumer recycled content copying paper has become a standard at the studio. All of our printing is done with soy-based inks. All of our copy machines have two sided copying features. All leftover food, the excess from productions and events, is directed to one of LA's several food banks. The paint sold in our studio paint shop is latex water-based paint. When any film or TV project, a studio program, or a capital improvement is financially analyzed, it has to have an acceptable rate of return to be considered, and FOX is a publicly held company, so every financial transaction is scrutinized for profitability and pay-back.. Today most of these programs sound standard, but creating the system and process, and getting funding and approval took tireless effort from many committed employees.

To recap: We implemented extensive recycling programs and waste reduction programs. We contribute tens of thousands of dollars each year to a number of environmental organizations, but we still get singled out by activist organizations for not doing more. I mention this because when I started out to green FOX, it was out of pure interest. At the time I started down this road, I was the Director of Production Operations, but out of personal conviction, I decided to return to school, here at UCLA. Through their extension program, I received a certificate in Solid Waste Management and Hazardous Waste Management. One day I approached the Sr. VP of the studio and asked if I could start a recycling program. He agreed with the caveat that it couldn't cost us anything. We had a hard time, the system was changed substantially, and then everything began to work out. FOX became a stellar performer.

But I have to remind myself that we make movies. We are not an R&D facility. New programs have to make good business sense. It is not reasonable for our business to install a fuel tank converting a small fleet of vehicles on a small production lot. It is better to consider a climate neutral program for our lot and for our employees. When I was here in April, I talked about a climate neutral program that would analyze our emissions, develop an offset program such as planting trees and educate our employees to help them understand the effects of global warming and learn how to offset their own personal emissions. This is probably a better use of our time. I was not successful in establishing this program this year, but I will try again next year.

This year, State Senator Murray will be carrying an energy bill for the Governor. FOX will again consider the opportunity cost, the present payback and see if it is financially feasible. The industry is attempting to develop a digital delivery system as well. This will allow film and television products to be delivered electronically, potentially eliminating the mass use of video-tape. Last year, FOX recycled 11.4 tons of video-tapes. The CFO in charge of doing this analyzed it, and if they can successfully develop a secure system, the benefits of direct access, trackability and security, dwarfs the savings from not buying

the video-tape. It's smart business, and it's a smart environmental program. The challenge of Green is to come up with both a successful business model and a successful environmental project.

The last thing I want to talk about is how to make recycling and true environmentalism cool again. Over the last couple of years, we have seen our laws relax and our philosophy change again. What happened? When did it become cool to buy a car that gets 12 to 15 miles per gallon and be proud of it? State laws have been passed to tax people on diapers, cell phones, etc. The public sees environmental programs as a cost. The key here is that we need to educate. I applaud the work of ECIO and EMA for using images and celebrity to make a difference. People like you and me make this possible, and we need to reach out to them. We need to educate, and that is the only way we can make a difference. Thank you.

Audience: What does it take to donate excess food to food banks?

Audience: My name is Mike, and I am a location manager. On three or four shows that I have worked on recently, we have contacted the local food bank. What it takes is for someone to contact the local food bank and coordinate with them and the caterer. The Good Samaritan law protects the donor.

Audience: What are the barriers of doing such things as recycling and green purchasing?

Lewotsky: FOX is actually pretty good at purchasing programs. As I said before, we use 30 percent post-consumer recycled content. We try to promote this wherever we can. We try to identify the areas where we can implement the policy. Part of it goes back to cost - it's always a premium cost. A department is given money to buy whatever supplies they need and must stay within a limited range.

Ted Reiff

Our focus is very specialized on the reuse and salvage of building materials only. We are a non-profit organization, which will be expanding out-of-state next year. Our involvement in the movie industry has to a large extent been through the movie "The Matrix" and Warner Brothers. We have done some salvaging out of Universal and several small set productions for TV that were filmed in places like San Diego, Alameda and Los Angeles.

First, I would like to cover some basic definitions. Recycle: that tin can today will be a part of a Chevrolet tomorrow. Reuse: to use that same product again in another context. Salvage: save from destruction. Deconstruction: process in which we salvage the optimal amount of materials from a building or a structure and provide it for reuse.

A lot of people confuse recycling and reuse. It boils down to two words: embodied energy. What is embodied energy? Embodied energy is the thing that goes into a product to make it useful. When we throw a product away and recycle it, we are throwing away the energy. By reusing that product we save that energy and do not have to worry about the additional effort or resources required to change its form.

We try to specialize and find a market for these items (doors, windows, cabinets, and lumber), anything within the building and set industries. Our focus is to reuse. As a non-profit organization, all these items are donated to us, and the individual or group takes a tax deduction. We oftentimes can reduce overall project cost (and certainly reduce

disposal cost to a certain degree.) And we can improve the local standard of living. Our product goes into the community at a cheaper price and is usually better made.

Looking at the movie set of "Matrix 2 and 3" that we were involved in Alameda. There were three sets. The first one was a tenement set in New York. The second was the oracle set. And the third, a freeway chase scene set. They built a 1.5 mile freeway in Alameda. There was eleven thousand tons of material that were recycled or reused; it represented 10 percent of Alameda's solid waste each year. There were actually 3.9 miles of concrete rail that we had to go through to recycle. The base rock was sold over the next two years at 5-6 dollars a ton. Seven thousand tons of concrete were recycled. We had thirty-seven tractor trailers of used lumber (all but two loads were used in low income homes in Mexico), one-hundred thousand cubic feet of polystyrene were reused, 1,500 tons of steel that was not recycled but reused in other structures. Again, we were saving embodied energy.

Lessons learned: 1) When designing and engineering a set, consider what the easiest way to disassemble the set will be. 2) Try to assess the industry and then think through the set construction and how it can best be salvaged. 3) Schedule time: one of the problems is time because time is money. The important thing to do is to figure out that deconstruction takes a little longer because we are trying to salvage as much as we can. On "The Matrix," the crews who built the sets did some of their own deconstruction and consequently the producers wanted us to reduce our cost, which we did. Well, it turns out that construction crews don't know how to properly deconstruct. It turned out to cost us additional money to redo the materials which they practically destroyed. From an industry standpoint, I urge that you don't ask your crew to deconstruct because they do not know how to handle the material, and it could be more costly.

Sarah Diefendorf

The U.S. EPA is our primary project partner. Our project is "Environment and TV." Our project is entitled "Act Environmentally." We work for cleaner business. We were founded by the U.S. EPA ten years ago. They were our original funders. They provided seed grants for a number of finance centers across the country, each located in a university. Right now, there are about nine of us. We are not part of the EPA, but rather a non-profit organization. We try to encourage industry and consumers to adopt greener practices, which include green business development, environmental mediation, and teaching and promoting pollution prevention.

Our "Act Environmentally" project is a partnership between us and the EPA. Other partners include the Integrated Waste Management Board and UCLA. It is an effort to encourage the TV industry to incorporate environmental messages and behavior in its programming. We look at this from the perspective that one environmental product placement message in one episode is good but a consistent environmental message is even better. We think that TV is the perfect venue for this type of project.

Getting into this project, we took a look at the environment and how it was presented in TV over the years. Strangely enough, the environment over the years has become a rare find. We did an overview of TV shows and looked at them in terms of their setting (whether they were a game show, documentary, etc.) But what we were really interested in was in looking at was if they were rural, urban, or suburban in nature.

What we found was that rural presentation (rural being wilderness, farmland, essentially out in nature) was pretty evident in TV shows from the early 1960's up until about 1969.

But rural representation dropped down to practically nothing by 2005, while urban and suburban grew to have the widest levels of representation. Today, about 50 percent of the settings in TV are urban. By the late 1990's through today, there are hardly any rural shows left besides "Bay Watch," and now, in 2005, "Lost." Virtually all of the scripted shows are in urban and suburban settings.

This leads to the question: because of the absence of the environment on TV does it change how we care about it in real life? What we are essentially doing is assessing the impact of shows that have environmental messages imbedded in their programs and whether or not there is historical data that viewers send mail in appreciation of the environment.

When we are talking about consistent product placement, we are talking about behaviors that characters consistently do such as recycling, having a blue bin in the kitchen, hanging laundry outside, composting, riding bikes versus driving, and products such as compost bins, recycling bins, ceiling fans instead of A.C., and bamboo flooring (especially on home improvement shows.)

Our approach has been to define products and behaviors that we want to promote. We developed a short list on one page to address the issues that are most important in waste management and to determine the shows and producers we want to go after. We found the best approach to be cold calling. Find your show, find your producer and try to track them down to see if they are interested in this project. Our initial approach was to target reality shows such as cooking shows and home improvement shows. It is an ideal setting because people tune in to learn, therefore, it could promote environmental behaviors and push products.

We have received a high level of interest from various shows. Officially, this project has not kicked off yet. We have high levels of interest (including interest from a pilot show.) They love the idea, but they do not know what to expect from us since they have no time to learn or research. They are on a very tight budget. We came up with the idea to give them our one-pager and go from there. They came back and said they wanted a whole list of products that were appropriate to the sponsors of our shows, where these products can be found, cost, price, etc. The same went for the list of behaviors. And that is what we are trying to put together now.

What do we want from these productions? We want to advise them on what they do and do not want to use. We want access to their websites. One of the things we can do is assess the environmental impact of product messaging on shows if we have access to the fans. Fans' websites are amazing because fans are so engaged and talking on the bulletin boards, blogs, etc. It has become relatively easy. We want access to the website to see what the fans' behaviors are.

In terms of the future, we will continue to talk to the shows, and we will launch this product. We will continue to develop the product and behavior list. We want to be able to see if it is going to make an impact at all. We want to know historically if it has made a difference up until now. We will explore new partners and invite new partners to join us, especially in developing an environmental management system in regard to small and medium productions. This would be an environmental management system that targets these specific industries. Final thoughts: TV has an immense amount of power, and our project has vast amounts of tools, knowledge and people to help these productions do these kinds of things. Thank you.

Rosario Marin

This particular role, the chairwoman of the California Waste Management Board, has brought together so many of my different experiences. A few years ago, I was a California Film Commissioner, and as a former mayor, I know the importance of filming in California. Now we have a Governor that is a former actor who is very environmentally friendly. The film industry has done a great job, and we need to recognize this, and so I applaud you. The California Waste Management Board supports and stands behind you. You are forming alliances that are bringing an important message not only to California but to the rest of the world.

I used to be the Treasurer of the U.S. Everybody says I went from green to greener with this position. I know a little something about making things green. We actually used to recycle a lot of clothes for your dollar bills. They actually are made up of your jeans. It is true. So, I've been recycling for a long time.

Gretchen was talking about how California has mandated recycling. In fact, fifteen years ago, when we introduced AB 939, the goal was to specifically reduce the waste that California sent to landfills by 50 percent. Right now it is 47 percent. We are almost there, but we can do more and better. The most important thing is that everyone can do something, regardless of what and where you are. You can always recycle and do your part. We have cities that have gone beyond the 50 percent that is mandated by the state, for instance San Francisco has reduced the waste it sends to landfills by 75 percent, and it's hoping to reach zero waste by 2020. We believe that we can achieve zero waste in California. What is zero waste? We talk about Reduce, Reuse and Recycle. More and more people are doing that. California leads the nation in its recycling efforts. Our official slogan could be "zero waste, thanks for nothing."

We work with a variety of industries and organizations to help them achieve their goals. We are very pleased to partner with many of you here today. We believe that together we can share ideas on how we can better fight to protect our environment and our resources. Just look at the information from the motion picture industry: the eight major Hollywood studios diverted almost twenty-thousand tons of waste from landfills in 2003. That is truly remarkable. In recycling materials, like stage sets, the industry was able to reduce green-house gas emissions by 8,000 tons. That saved over 260,000 million BTUs, enough energy to supply over 25,000 homes or operate over 4,000 passenger cars for one year. The amount of paper recycled by the studios only saved over 8,000 trees.

When you look at the statistics, it is amazing how much one industry can do alone. ABC Studio's, "According to Jim," became the first paperless writing staffs in TV history, saving over 300,000 sheets of paper a year and in the process saving time otherwise lost to photocopying. The director of the Fox movie and his collaborators, "The Day After Tomorrow," paid out of their own pockets to make the production carbon neutral, by purchasing carbon offsets that were used to plant trees and invest in energy efficient technology to offset the carbon dioxide emissions from the production. The Re-Use people were able to salvage 97 percent of the set materials from the "Matrix Reloaded" and "Revolution" movies and saved over eleven-thousand tons of material. This is just a fraction of what's happening in the industry. We are very happy and grateful to all of you that have contributed.

In conclusion, these efforts may not get us an Oscar, but they will give us a better world for our children and for their future. This forum is designed to show how you can help in this effort. I look forward to working with all of you. Thank you so very much.

Mike Fantasia

(Text omitted)

Kathy McCurdy and Kimberly Pudgil

(Text omitted)

Michael Paparian

I want to try to provide some context to what we talked about today. I have been on the Waste Board for a little over four years. I head up the Sustainability and Marketing Development Committee. Prior to that, I was with the Sierra Club for 22 years. It is deep in my heart to push for sustainability and push for a lot of the concepts we talked about today.

One of the projects that I have been working on with the state government is an effort to green state government and show it off. Some of the concepts of greening state government are similar to the concepts we have talked about here today. There is a long way to go in showcasing what has been going on. In state government, we actually have one of the most energy efficient high rises in Sacramento. We heard about zero waste being the goal. Zero is a concept that is prevalent in a lot of industries. In film, you don't want to lose moments, zero-loss moments. They don't want to lose resources, like we don't want to lose environmental resources.

So what are some of the principles? I put them into five categories: buying green, building green, working green, traveling green, and showcasing green. Buying green: buying recycled content, some of these products change over time. For example, 30 percent is the standard for paper. Now there is 100 percent recycled content paper. Building green: the LEED certification is a great program. The Governor last month signed a bill requiring all government buildings to be LEED certified. I think it helps provide a standard. Working green: how to ensure that the work that we do, that the industry does, is done in an environmentally sensitive manner.

This includes sensitivity to the direct environmental impact, the natural features of a location, and making sure the things you do at the location, are as environmental as possible. Traveling green: recently we launched a program, to certify a green hotel. We have many that have met the standards we set. Showcasing green: sell it and promote it wherever possible. For example, seeing a character throwing something into a recycling bin instead of a trash bin.

We learned a lot here today. I would like to quote Kermit the Frog, "It ain't easy being green." If we continue to buy, build, work, travel, and showcase green, I think it would make it a lot easier to be green. I thank you all for your time here today.

Matthew Cooper

I was the production legal consultant on the "Lords of the Ring" trilogy and worked closely with the location department throughout filming. I was an environmental lawyer by trade when in New Zealand and I brought some unique skills to the location department. We shot on over one hundred and twenty locations during filming which included national parks, and reserves, many places where a large film crew had not been to before. We had a shooting crew of up to 3,000 people (?) and seven film units filming at any one time and as a consequence there were significant potential physical environmental impacts surrounding filming at a location. Through my role on the trilogy

I gained some valuable insights into the environmental impacts a film crew can have and the ways of effectively mitigating those effects.

New Zealand has very strong environmental legislation. We had to work within a structure that was geared toward environmental protection and minimizing the environmental effects of a particular activity. We came up with unique ways of protecting the environment and still getting the creative results we needed. What I have done is put together a case study based on the filming at one of the most significant locations on the trilogy, Mount Potts in the middle of the south island of New Zealand. In order to assist I have brought along some EPK background footage on the Mount Potts location which I will show to everyone now. (A video piece is shown.)

In putting together the project, it took three to five months to construct the buildings, roads and another six to seven months to reinstate the land back to its natural state. Prior to our activity on site it was a pristine location and therefore it was important that we protect and preserve the site. We carefully preserved the environment and while building temporary roads to allow for access we removed some 10,000 tussock plants and kept them alive in local nurseries. It was important to do this to ensure that we were protecting the local native gene stocks and not introducing anything adverse into the environment. And when filming was complete we put everything back again.

In New Zealand there is legislation in place that requires that you put together a statement of what the potential environmental effects of any activity are and clearly state the proposed methods for avoiding or mitigating such environmental effects. This legislation applies to filming activity. In our case, we had to describe the fact that there would be two to three months of road construction and 12 months of set construction and all of the potential environmental effects surrounding that activity. The government looked at the background of the film company and the potential effects described in our proposal included the building of temporary roads, bridges, four-wheel drive tracks, special effects, horses, the effects of crew and foot traffic, etc.

The role I played and frequently what a location manger will do on a film production, is consult with local land owners, government, and environmental groups. We also enlisted local environmental consultants to prepare ecological reports. For example, we used the local consultants to help design our bridge crossings in a way that would not interfere with the flow of the river, and we designed culverts that were large enough to maintain enough water velocity so that the salmon can still get up river and spawn. We also implemented a no helicopter fly-zone in areas where native bird species were roosting to protect local bird populations, and we limited areas that the crew could go in. There were a host of environmental conditions we negotiated with the local council but at the end of the day we ensured we had a set of standards that protected the environment while still ensuring we got the creative results we needed.

The key environmental issues when filming on a sensitive location which I identified in the environmental applications for the film included: ensuring adequate ground cover to prevent any trampling of sensitive vegetation; if you are on public land, the issue of the use of horses on some of New Zealand's conservation land; noise arising from filming activities; use of helicopters; and special effects must be adequately described and addressed in any application. Applicants should also be aware of where temporary structures are and are not permitted. Generally, the environmental effects and any environmental conditions are easily defined and addressed, but you have to make sure the crews are aware of what they can and can't do depending on the nature of the location.

Building on what I have already talked about, we had two significant sets in the North Island of New Zealand located on world heritage park or reserve land, where we had to set up rostrums and boards to protect the land and cordon off areas where the crew could not walk. Protection measures included the cordoning off of sensitive vegetation, use of local council staff to monitor or activities on-site, and ongoing consultation with the local community members, indigenous and council people. On some of our larger South Island locations we also used helicopters to transport equipment whilst on location in order to avoid the effects of using vehicles and crew to move equipment. The purpose of this case study is to show that you can conduct a major motion picture and get the creative results needed while still maintaining a pristine environment. The point is that filming and environmental protection are not mutually exclusive events. By managing the environmental effects of filming activity on sensitive land, filming can be a valuable source of funding for the continued protection of the parks and reserves whilst putting these unique environments on show to the world. (Video is shown.)

Charles Corbett

I wanted to bring out the research team. They have done a fantastic job over the last eighteen months. I think you have heard a lot of perspectives on environmental impacts, things that can be done, have been done and will be done. It has been said that the university is the least suited place to make changes in the world because we love to sit in an ivory tower and philosophize about things. It is out there in the work place that things really happen. The main objective of today is getting people to talk to each other, make connections in hopes to have more events like this, but actually organized by the location managers, environmental guilds, the DGA, SAP, ECIO, EMA, etc. We look forward to many events like this, in many places around the world. I hope that you have taken away some valuable lessons, and hopefully we can all keep in touch and have more forums like this.

Appendix G: Letters of Support

Governor Arnold Schwarzenegger

GOVERNOR ARNOLD SCHWARZENEGGER

January 20, 2005

Dear Motion Picture and Television Industry Associates,

From unmatched technology to leadership in the environment, California guides the nation, and through sustainable energy strategies, we are doing it again.

As Governor, my priority is restoring the luster of our Golden State. The health of our economy is firmly bound to environmental stewardship. Sustainable and renewable energy tactics are the key to our long-term success, and already there are hundreds of California businesses working on these new technologies. Renewable energy projects provide greater energy security and stimulate visionary businesses—converting urban greenwaste to energy, for instance. I have made a promise to obtain a third of California's energy from renewable energy sources by 2020.

Despite tremendous achievements in creating high-quality, sustainable jobs for the future, we continue to face tremendous hurdles. As professionals in one of California's – and the nation's - most visible industries, your actions affect the economy and the environment on a global scale. The Motion Picture Industry Sustainability Project reflects the outstanding accomplishments in one of our most important industries and embodies the spirit of collaboration that is the future of our state.

We can not merely talk about the environment and the economy, we must take action. It is important to send a message to Californians and the rest of the world that reinforces our commitment to protecting our valuable resources.

Together, we will restore the promise and prosperity of our Golden State.

Sincerely,

Arnold Schwarzenegger

STATE CAPITOL • SACRAMENTO, CALIFORNIA 95814 • (916) 445-2841

Ed Begley, Jr., Actor

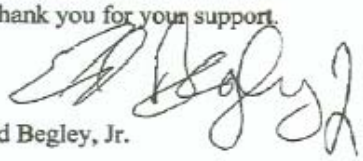
Ed Begley, Jr.
3940 Laurel Canyon Blvd. #981
Studio City CA 91604
http://www.edbegley.com
edbegley@aol.com

Dear Friends,

The motion picture and TV industry can play a leading role in addressing issues of sustainability in California and beyond. In light of the visibility and the economic impact of the industry, and in order to maintain a position of moral leadership, I believe it is essential for us to deal with these environmental challenges.

Therefore, I strongly support the project on "Motion Picture Industry Sustainability", executed by UCLA and sponsored by the California Integrated Waste Management Board, and I encourage you to assist the project in any way you can, by providing the team information to showcase best environmental practices in the industry or by attending the forum to be held at UCLA on February 4, 2005. For more information, please contact Professor Charles Corbett (charles.corbett@anderson.ucla.edu or 310-825-1651).

Thank you for your support.



Ed Begley, Jr.

Roland Emmerich, Director

CENTROPOLIS
ENTERTAINMENT

Dear Friends,

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Thank you for your support.

Roland Emmerich
Director, *The Day After Tomorrow*, *The Patriot*, *Godzilla*, *Independence Day*

1445 N. Stanley Avenue, 3rd Floor, Los Angeles, CA 90046
Tel: (323) 850-1212 Fax: (323) 850-1201

Gale Anne Hurd, Producer / Executive Producer

January 6, 2005

Dear Friends,

The motion picture and TV industry can play a leading role in addressing issues of sustainability in California and beyond. In light of the visibility and the economic impact of the industry, and in order to maintain a position of moral leadership, I believe it is essential for us to provide leadership in addressing these environmental challenges.

Therefore, I strongly support the project on "Motion Picture Industry Sustainability", executed by UCLA and sponsored by the California Integrated Waste Management Board, and I encourage you to assist the project in any way you can, by providing the team access to information or by attending the forum to be held at UCLA on February 4, 2005. For more information, please contact Professor Charles Corbett (charles.corbett@anderson.ucla.edu or 310-825-1651).

Thank you for your support, and Happy New Year!

Gale

Gale Anne Hurd
Producer/Executive Producer, *Terminator series (1, 2 and 3), Hulk, Armageddon, Dante's Peak, Aliens.*

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