

The Narrative of Renewable Sources of Energy in Science Fiction Films

Islam Abohela

Civil and Architectural Engineering Department, College of Engineering, Applied Science University, Bahrain

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Abstract: We identify how images of future cities in science fiction films make global information change more widely available to the public. However, it is noticed the continuous representation of the future as deteriorated and declining future. This paper aims to identify how the images of future cities in science fiction films are affected by the current developments in renewable sources of energy and their integration within the city. It can be argued that science fiction films generally lack references to renewable sources of energy. The scarcity of these references to renewable sources of energy in science fiction films can be attributed to the perception of these images as a representation of a prosperous future society while, in many occasions, science fiction films depict future cities as a dystopia. This paper examines this assumption by comparing the dystopic visions of future cities to the utopic vision in science fiction films through the implementation of renewable sources of energy within the depicted future city and its buildings.

Keywords: Science Fiction; Film; Renewable; Utopia, Dystopia.

1 Background

1.1 Science Fiction as a Window to the Future

In the information community the dominant language is the image, and the most influential images are in the medium of film. Film is a cybernetic structure. The celluloid strip may be considered a sort of developmental code that is read by the projector to bring to life the specific form of a moving image within a certain context. Even when the audience has left the auditorium, the film continues its own life. The celluloid code has been translated into the biological nervous system, becoming memories, fantasies and inspirations that eventually influence the real world through our actions [1]. Film has helped in paving the way for new ideas and generated popular acceptance of these ideas which might not be realized nowadays but might do so after many years [2].

The medium of film is a medium that has been created for utopian or dystopian visions answering many questions such as, what form will our lives and work take on tomorrow and the day after tomorrow? Will overpopulation change us into amphibian creatures who build cities half on and half under the water? Or will ozone holes make us cave people who avoid the light of day and build underground dwellings? Will

we be able to inhabit our planet, robbed of its natural equilibrium and raw materials, shaken by catastrophe after catastrophe, only in specially-fortified cities, or will our children and their children, to ensure the survival of the species, be forced to escape to settlements equipped with artificial gravity and greenery? Or will the endless urban sprawls simply continue to grow until cities become garbage dumps with no water that's fit to drink, paralyzed by traffic jams, crime, noise, air pollution, health problems, and energy depletion? What new, energy saving, recyclable building materials will be discovered, and how will the new and age-old energy sources of sun, wind, and water be employed? [3] Science Fiction films offer a virtual environment tackling these questions and offering alternative stories for our current ones.

Where it may have been helpful to use the science fiction genre to raise public awareness about Global Warming, it is perhaps the time to refocus and imagine a way out of our situation through film-based explorations of renewable energy technologies. This paper looks at the problems associated with the persistence of presenting a dystopian view over a utopian perspective. Accordingly, this includes an investigation of how renewable sources of energy are portrayed in films in general and science fiction films in

*Corresponding author e-mail: islam.abohela@asu.edu.bh

particular focusing on the significance of including these technologies in films.

1.2 Role of Film in Conditioning and Desensitizing

The history of modern film is not long. However its ability as an effective and influential medium, one that is capable of defining the expectations of society, is great. The medium of film is capable of conditioning society to accept innovation or desensitizing them to care. This is a psychological phenomenon that makes people more accepting of changing events, technology and our urban state. We can refer to this as “future conditioning” as it is used to suggest the eventual technological developments that could happen in a future time.



Fig. 1: Left: Screen shot from Armageddon (1998), fictional depiction of WTC destruction, right: WTC reality destruction in 2001.

Film has the ability to condition people to believe and accept. It holds the power of suggestion through visualization. People do not react (positively or negatively) to current issues and events, due in part to the desensitization that has resulted from exposure to mass media. Film in particular, and the effectiveness of CGI (Computer –Generated Imagery) and f/x (Special Effects) in the fictional depiction of horrific events makes real events less impactful or disturbing. Even the initial reaction to occurrences such as 9/11 and the destruction from major weather events, had already been seen in films such as “Armageddon” (1998) and “The Day After Tomorrow” (2004) (Figure 1). Reality loses its shock value as the public sees an increasing blur between f/x and life events.

Science fiction films have future speculation as their primary purpose. This genre is the perfect case for building upon existing scientific knowledge in renewable energy technologies, and to speculate on its widespread incorporation into architectural and urban environments. In this way, there is a huge positive potential in the film industry to assist in preparing society for the reality of our energy future through including inventive applications of renewable energy. Repeated exposure to the incorporation of different renewable energy systems in future environments has the potential to assist the energy sector in the implementation of these systems.

2 Climate Change and Science Fiction Films

Although Broman and Kandpal [4] argued that science fiction has miscommunicated the problem of climate change to the public due to dramatic requirements, Hughes et al [5] asserted that novels play a powerful role in communicating climate change and educating the public of the consequences of global warming. The same applies to science fiction films especially in a digital world where the message is sent through film to a wider audience in less time.

However, one must be careful with the portrayed scientific backgrounds [6]. Gregory Benford distinguishes carefully between currently feasible technological solutions and the kinds of advanced possibilities that he writes about in his fiction [7]. Estok [8] emphasizes the importance of telling the stories of science through books and films.

Estok agreed that film lacks the depth of complexity of the lab; nevertheless, it has a profound value because science in the form of stories produces fact cerebrally, emotionally, and tangibly which simplifies the scientific facts to be easily understood by the public. This highlights the importance of documentary films that present scientific facts in a more interesting way while putting the scientific fact in a more serious and credible context than science fiction films.

Where science is based in rigorous research, science fiction has tended to take a less responsible and more responsive position. What are the concerns of the day? This begs to ask what sort of research is involved in the generation of future speculations. Who designs film environments and what is their educational background? What are the preoccupations of the Director? Where does science fiction stop and science fantasy begin?

Much of the success of “2001: A Space Odyssey” (1968) is due to the believability of the science presented in the film. Stanley Kubrick employed consultants from NASA to assist in

The development of the space station sets. The quality and design of the sets is far superior to the realities of the present International Space Station. As a result the expectations of most people would be that the actual space station should be able to include such cleanly designed ship interiors. The visualizations of the film succeeded in conditioning the expectations of the public. Other space films that were created immediately following “2001” such as “Silent Running” (which coincidentally used the same model and set designer in Douglas Trumbull) look far less believable as they did not use consultants and had much smaller budgets. Thus, there is a need to include experts and scientist at the early stages of making a film in order to communicate correct scientific facts [9].

Part of the problem with the majority of recent commercial science fiction films lies in the way they have chosen to portray energy-related issues of buildings and environments

in the future. Building related energy issues have been completely sidestepped. Most films present a future where the world is largely powered by “nothing”. Here lies the divide between “science fiction” and “science fantasy” in the creation of a blended genre film. Where many of the gadget or transportation-based suggestions might include credible research, the depiction of buildings, insofar as they are powered, is not addressed. This may be the result of a variety of factors. It could be as the result of general lack of awareness regarding renewable technologies. Filmmakers are not educated in this area and are likely assuming a status quo situation.

This would infer that energy supplied to buildings is likely supplied using similar methods nowadays. The use of fission, fusion, hydrogen or nuclear power would not translate into a visible difference in the image of the city. Alternately buildings are powered by some magical invention that is potentially uninteresting or complicated to work into the story line. Or the filmmaker is simply not interested in visualizing this part of the future. Accordingly, it is very important to investigate the image of future cities in science fiction films and examine the way in which these cities are portrayed.

3 Future Cities in Science Fiction Films

The fascination with the representation of the city in film began as early as the beginning of cinema. The powerful and important link between film and urban culture has developed due to the fact that both cinema and the city are always evolving. It is argued that the streets of the city, like cinema, are the site where transient impressions take place. Given such an affinity between city and film, it is no surprise that we can look back on almost 100 years of film history and find that the city occupied such an important status [10].

Cinema acted from its beginning as a laboratory for the exploration of the built world [11]. Film was the medium that represented the city most persuasively to the general public. It can be argued that film itself evolved as ‘urban art’, frequently articulating the narratives of city and investigating its strengths and weaknesses. In this context, films became useful instruments for understanding and critiquing the backdrops of the metropolitan city and its future [12]. The powerful symbolism that is associated with city architecture has turned films that depict future cities into sophisticated agents for political statements, entertaining messages from the state of the environment to the adversaries of technology with social unrest in between. The successful use of film as a tool for propaganda in the war periods strongly demonstrates this notion. These films help to define the concept of the city of the present, by examining the role it has played in the past and its expected position in the future.

There is no doubt that science fiction films provide planners with a cognitive space for the contemplation of future cities. Through awareness, perception, reasoning, and judgment, the message of the medium is analysed and interpreted in terms of today, in an attempt to shape tomorrow [13]. Film plays a significant role in introducing new ideas and debates to the public; it helps clarify these ideas in a simple and interesting way. It is believed that film introduced modern ideology to the public through movies like *The Fountainhead* (1949). However, when it comes to science fiction films there are two main strands used by filmmakers to draw the image of the city; utopia and dystopia.

3.1 Utopias VS. Dystopias

Technically utopia' means 'no-place', originally used by Thomas Moore in his 1516 monograph; the word suggests a spatial distance from the status quo. Dystopia is derived from a prefix implying impairment or abnormality [14]. Hence, the various depictions of future cities science fiction films can be interpreted as either utopian commentaries about the hopes and anticipation of tomorrow or, inversely as dystopic propositions; implicit criticisms of modern urban life and the economic system that produced it [15]. Science fiction cinema's visions of urban utopias and dystopias tended to invite reflection on social and political questions. Even if social and political issues were not explicitly addressed in the film itself, science fiction cityscapes tended invariably to invoke cultural meanings around, for example, scientific progress, urban decay, nuclear holocaust, and other preoccupations [16].

3.1.1 Utopia in Film

Much of science-fiction and fantasy literature of the pre-cinematic age was concerned with the creation of utopias [15]. Hence, utopian literature was and is still a key source for science fiction films. Utopian literature is broadly defined as writings about non-existent places whose politics, laws and living conditions are ideally perfect. Science fiction's attitudes towards such places fluctuate between idealism and cynicism, but a common plot element in utopian science fiction involves an intrusion from outside into, and an ensuing disruption of, a utopia: the narrative then explores the consequences of the changes brought about by the intrusion. The utopian tradition also embraces its antithesis; dystopias, places which are the very opposite of perfect. In constructing and exploring these extreme forms of social organization, utopian narratives are doubly fictional: they set up a utopian or dystopian place as a setting for a story, while at the same time the place itself becomes the story [16].

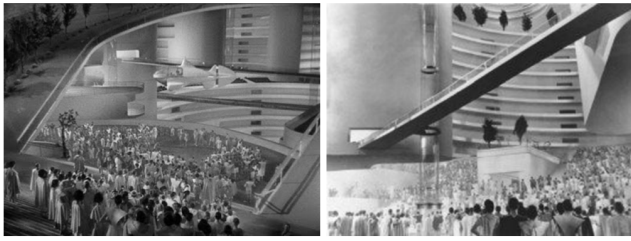


Fig. 2: Shots from the modern city of 2036, Everytown in *Things to Come* (1936).

As early as the silent film era, utopian/dystopic fiction was deeply seated in set designs and storylines as a positive or negative response to the concurrent version of modernism and its utopian themes [17]. The films *Just Imagine* (1930) and, *Things to Come* (1936) provided seemingly a positive view of the future city. *Just Imagine* (1930) was one of the few overtly optimistic science fiction films of Hollywood's classical era. It was a combination of the newly popular genre of the musical and the still-palpable influence of German Expressionism on Hollywood cinema; it uneasily swung between dystopic fiction and standard 'boy gets girl' comedy. Thematically, the film looked forward to George Lucas's early chase thriller, *THX-1138* (1970), with its use of letters and numbers in place of names and the overall dystopic dehumanization of its urban citizenry.

In addition, *Things to Come* (1936), based on H. G. Wells's 1934 novel; *The Shape of Things to Come* attempted another utopian vision of future. Unlike so many Sci-Fi films which decried failure of science and technology to solve human problems, *Things to Come* (1936) looked forward optimistically to future scientific triumphs [18]. The modern city of 2036, Everytown, was represented by multi-storey buildings, moving sidewalks, and a domed glass shell protecting the climate, marking off city from exterior countryside and diffusing light to an even glow [15] (Figure 2). This utopia, however, had much in common with the conclusion of the dystopia of *Metropolis* (1927). In Wells's future, the human race would be saved by benevolent despots and technocrats who had rationally determined humankind's appropriate course of action. The underlying worldview of *Things to Come* (1936) is in favour of the idea that the capitalist system is the true, natural order. The technocrats are the natural leaders because of their superior technology, and in the society they have created, non-productive citizens were devalued [18].

3.1.2 Dystopia in Film

On the other hand, the dystopic image of the city of the future can be traced back earlier in *Metropolis* (1927). In *Metropolis*, the city orderliness and symmetry above ground were perhaps more visible in Erich Kettelhut's set design, but balance and uniformity between parts were emphasized for the factory scenes through camera framing and for the

workers via blocking of actors' movements. Additionally, *Metropolis*'s poster provided a strong concentration of pertinent motifs - sleek skyscrapers, critical arteries, and pyramid peaks (Figure 3). The modern functional utopia of Le Corbusier's contemporary city and *Metropolis* (1927) on the one hand versus the radical visions of Wells's and *Things to Come* (1936) on the other illustrated different modes of political analysis of a proper utopia. Yet in such diverse anticipations of the future, similarities occurred in the features of architecture (slab-block high-rises and peaked skyscrapers, breath-taking vistas from the more significant buildings, diffused lighting); symmetry and balance in the cityscapes; orderly and rational, mass transportation systems; and efficient, immediate, and extensive methods of communication (both films visualize television and computer screens as signal media for mass information) [15].



Fig. 3: Poster of the movie *Metropolis* (1927).

Subsequently, this wave of utopian/dystopic model of fiction had an influential shift with the advent of WWII where the genre of utopian science fiction was almost banished in favour of more pessimistic modes of literature and the gloomy model of film noir [18]. The embodiment of the city in this period was neither extrapolative nor speculative but more of an urban introspection. Future noir films drew upon and quoted from a reserve of shared cultural images of progress in the built environment. There was a series of iconographic motifs which were associated with well-known utopian visions that were often quoted in the future noir genre with irony. In doing so, these films expressed a significant loss of faith in the idealism from which these images originated [15]. It used some certain features of utopian designs like symmetry, order, and clarity of which future noir dystopias played for signification, as a sort of oppositional strategy for constructing a dialogical criticism of the social or political order the ideal community represented.

The next wave of city depiction in science fiction films was a reaction to the influence of post-modernism on the city. It brought fears of urban decay, growing threat of pollution and

potentially destructive class differences, all of which were mirrored in Ridley Scott's *Blade Runner* (1982). In this film, the visual of 2019 Los Angeles City had specific architectural reference back to Lang's *Metropolis* (1927) and later influenced *Batman* (1989) and *Dick Tracy* (1990) [14]. The plot did not cohere around a central plan for reform, rather, the film seemed as random shots at deficiencies and grievances of present-day life. Integral to all these dystopias is a bleak criticism of utopian versions of high modernist architecture and modern cityscapes, structures which harboured corrupt economic and social institutions. It can be argued that the post-modern model of future city in Sci-Fi films featured a denunciation of the utopian vision through both narrative propositions about the society and also via *Mise-en-scène* as impaired physical constructions, and visions of the makers' hopes.

The previous argument showed that dystopias have the upper hand over utopian fiction. It sets out that the fear that humanity can allow its own civilization to self-destruct, is far more significant than the hope of better future of the city. Susan Sontag made a worthy observation about science fiction in 'The Imagination of Disaster'; she wrote:

"Science fiction films are not about science. They are about disaster, which is one of the oldest subjects of art.... Thus, the science fiction film ... is concerned with the aesthetics of destruction, with the peculiar beauties to be found in wreaking havoc, making a mess." [15]

3.2 Real versus Fiction: The Potential of Advanced Buildings as Film Locations

The integration of existing urban or architectural settings into future scenarios is an effective means of creating persuasive films. Where research may lay beyond the scope or interest of current filmmakers, location shooting remains popular. Skyscrapers and exotic buildings such as the Burj Khalifa are often used in films to create cutting-edge environments. Three-dimensional modelling has permitted the number of relatively futuristic-looking contemporary buildings to increase.

Some architects have started designing buildings with novel ideas integrating renewables within buildings to have buildings that are near to being self-sufficient in terms of energy. Examples of this are the Bahrain World Trade Centre, Strata SE1 Building in London and the Pearl River Tower in China (Figure 4) [19]; all three building integrated wind turbines [20] that make them potential places for shooting scenes in science fiction films. Regardless of this being the case, ideas of buildings integrating renewable sources of energy or these already existing buildings have not yet been adopted in films.

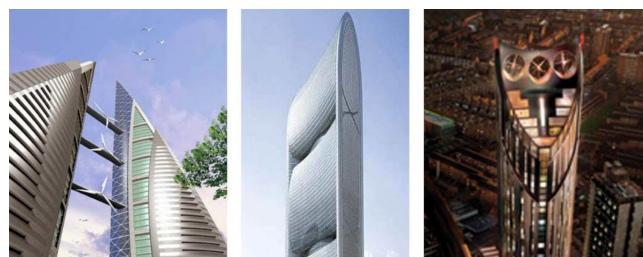


Fig.1: left to right: Bahrain World Trade Centre, Pearl River Tower in China, Strata SE1 project in London.

4 The Relationship between Renewables and Future City

Science fiction as a genre has been credited with the ability of raising public awareness about the degradation of the planet, with particular reference to visualizations of the impact of global warming [21]. Science fiction films in particular have been noted as more influential than texts due to their ability to visualize.

Well-written science fiction may reach a larger cross section of the public, while emphasizing that climate projections are principally intended as warnings, not prophecies. Science fiction film makes global information change more widely available to the public. In addition, fictional scenarios may suggest new directions of research, and offer unexpected insights into potential impacts, which may have been overlooked or underestimated [22].

The nature of science fiction film is to focus on the creation of speculative environments set in a future time. Fictional narratives, coupled with current f/x (Special Effects) and film technologies permit unrestrained speculation on life "in the future" including cultural, architectural, urban and natural environments. Although the depletion of earth's resources is evident and it has been demonstrated in many films the dark future earth might face, one can notice the scarcity of the scientific-based and practical solutions offered for this problem. Where a significant number of recent science fiction films have chosen to develop plots based upon the effects of global warming, resulting in a highly dystopic view of the future, research shows that almost none have taken a more hopeful or utopian view.

4.1 Renewables in Science Fiction Films

A thorough examination of future-based films produces a very short list of those that have chosen to feature renewable energy or critical energy problems in their settings or plot. As it was the case for "Things to Come", war-based scenarios have often acted as the inspiration for these energy-focused science fiction films. The destruction of war accelerates the plot development and creates a narrative that supports the existence of a world that has not simply devolved (due to global warming) but is spectacularly

different. A number of films cite nuclear power as the destructive force, giving way for renewable, clean energy, to be included as a means of going forward.

James Cameron has assumed an environmentally-engaged directorial role in his films [23]. Greatly influenced by the cold war, the threat of nuclear annihilation has been a constant theme in his films. His film, “Avatar” (2009) brings to life an untouched, utopian landscape. This presents the audience with simultaneous references to what might have existed (before humanity ruined the world with technology) as well as what could exist in the future. Current methods of renewable energy such as PV and wind turbines are not used in the film. The extra-terrestrial landscape assumes a science fantasy position on the generation of energy in parallel to a science fiction position in the creation of the machinery and technology that forms the basis of the human settlements that are depicted.

Much of the Japanese manga/anime genre derives its plot and environments in reference to the destruction experienced at Hiroshima during WWII. Many of the future environments are depicted to either include parts of the city or world that continue to exist in a degraded state or that provide a more fantastical environment. Hayao Miyazaki, one of the chief creators at Studio Ghibli includes environmental themes in many of his animated films. One of the most environmentally focused one was “Nausicaä of the Valley of the Wind” (1984). The story revolves around a future world that has been devastated by a nuclear holocaust. While nuclear devastation is not a new theme, the film stands out in its clear adoption of wind energy powering the small pockets of humanity that have survived. It is notable that the style of wind machine closely replicates traditional Dutch windmills. The landscape and pastoral setting invoke a nostalgic feeling for the 19th century in spite of being set at least 1,000 years in the future. This generates a positive feeling towards wind as an energy solution but fails to create an innovative application of new technologies (Figure 5).



Fig. 2: “Nausicaä of the Valley of the Wind” (1984): This animated film from Studio Ghibli uses traditional wind turbines to power the valley.

“Oblivion” (2013) is another science fiction film that portrays the future of earth as a dystopia. The plot suggests that after the moon was destroyed by extra-terrestrial invaders, tsunamis and earthquakes hit the earth hard. However, for humans to survive they used nuclear power to win the war but contaminated the planet to the point of inhabitability. The references to energy in this film are quite pointed given that water (lakes, oceans) is being entirely removed from the earth in order to power the energy needs of a new off-planet society. This is one of the few future-based films where the creation of energy is the cause of major action in the plot as opposed to an incidental detail.

In Oblivion, one can notice three distinctive areas on earth; the vast contaminated area; the futuristic clean, smooth and elegant blue monochrome newly-built space settlement and the remote and seemingly limited green, fresh areas that remain. This lush area is used as a secret retreat and shows the protagonist’s house powered by a vertical axis wind turbine, a photovoltaic array and a solar panel (Figure 6). Although the wind turbine looks rusty and the solar panels look very old (pre-war), the context they are put in implies that people who lived here were keen on harnessing wind and sun power and generating their own electricity. Using these elements within this context promotes the idea of the dependence on renewables and integrating them within buildings for having buildings that are self-sufficient in terms of energy. However, this raises questions about the dependence of that society on renewables although they are very advanced in using nuclear power, which eventually led to the contamination of earth.

None of the films produced to date undertake an innovative or aggressive speculation on the positive impact of renewable energy. There is nothing compelling that is presented to promote renewable energy, certainly nothing significant enough to have the potential to condition the general public into acceptance of photovoltaic cells and wind turbines. However, this seems to be the intent of the film “The Hybrid Project – Air” [24] which has been completed within the Victoria and Albert Museum in London. The plot centres on a future society that has been driven to living underground. Wind energy is the focus of the potential for the salvation of the society. The exterior shots of the film were taken on a wind farm in Scotland. In this instance the future-conditioning potential is in the inclusion of existing technology as a central theme and not the proposition of a variation on current technologies. The budgetary limitations of the production have resulted in the use of present-day technologies filmed on location as the basis for a future world. As the potential distribution of the piece is likely to be limited, it will not have the impact of a commercial production.



Fig. 6: “Oblivion” (2013): The vertical axis wind turbine, photovoltaic cells and solar panels on top of the protagonist’s house.

The potential for digital- and film-based media is being used very proactively to promote the design of future green cities in the exhibitions of the recently-completed environmental education centre called “The Crystal” in London, England [25]. The building itself is being assessed for top scores in LEEDTM and BREEAM. The building, funded by Siemens, hosts the largest exhibition in the world on future cities. The state-of-the-art exhibits assist the visiting public in envisioning how current and future technologies will be used to actively transform cities into viable, healthy centers for urban living.

In addition to interactive, physical exhibits, a number of films have been produced that look at the transformation of recognizable, existing major cities such as New York, London and Copenhagen, by overlaying new systems and buildings over the existing urban fabric. This is a similar technique as it was used to lend future credibility to the Chicago-based setting in “I Robot”. Here though, for the first time in film we are given a comprehensive overlay of wind and photovoltaic systems, implemented on a broad urban scale using a smart energy grid (Figure 7). The film also incorporates advanced urban farming as well as addressing a general cleaning of water and land-based environments [25]. The future cities presented by this short film present a thoroughly utopian view of future life that could easily be seen as persuasive science fiction that has been based upon current and future technologies.



Fig. 7: “The Crystal Future Life Video”: A screen capture from the film showing the incorporation of green energy systems in the city of Copenhagen.

4.2 Renewables: Utopian or Dystopic?

Most fiction-based films tend to suggest that the future is either dystopic or utopian. The dystopic genre has tended to

focus on the inevitability of drastic environmental decline. Some films that would fall into this category would be “Things to Come” (1936), “Silent Running” (1972), “Soylent Green” (1973), “Blade Runner” (1982) and “The Fifth Element” (1997). The suggested timeframe for these varies significantly, but in each case the inclusion of a date/timeframe is a critical aspect of convincing the viewer as to the seriousness of the inevitability. The use of recognizable urban settings and architecture as a means to engage the viewer into visualizing the possibility of this decline is also important. This provides a level of realism to the proposal that is absent in purely fictitious settings. Environmental decline is additionally presented as a hopeless state without any suggested solution.

Where early dystopic films might initially have been disturbing or thought provoking, their sheer proliferation and absorption into mass media has likely resulted in desensitization as well. As we approach and bypass key dates such as 1984, 2001 and 2019, and nothing happens, the fictional aspect of the film tends to rise over its scientific suggestions. Viewers are reconditioned to suspend their belief in the inevitability of the situation.

Early science fiction films, although they are negative and dystopic in their portrayal of future culture and politics, tended to be fairly optimistic about inventions. Most films referenced videophones, large projection systems as well as advanced and sometimes flying automobiles. Where such technology would have seemed visionary to theatre-goers of the time, the current generation cannot imagine life without such communication technology. The impact of this film device becomes somewhat lost, validating the assumption that film does a very good job at conditioning the acceptance of future technologies.

Future-based films normally also include “futuristic” designs for buildings and urban environments. In the early days of film (1920s and 30s) futuristic building design was derived from the lines of early modern international style architecture which was not very common at the time. The materiality was often concrete and glass, with a certain amount of steel. Concrete was able to be used to portray highly curvilinear forms that were very much in contrast to the more traditional Victorian, Gothic or Neoclassical revival styles of the period.

Utopian films present the future in scientifically optimistic terms. The environment is extremely bright (sunny), with clean air and modern buildings. These films often include advanced technologies such as streamlined cars that tend not to use fossil-based fuels, holographic displays and robots. Scientific advances are often included in the plot and theme. Although there may be social problems depicted in this utopian view, these are presented as quite separate from the perfect environmental condition of the planet. Typical of this type would be “Minority Report” (2002) and “I Robot”

(2004). Through this we see that renewable energy likely requires a utopian, optimistic vision of the future.

The evolution of CGI technologies permitted the creation of increasingly realistic and detailed environments. Early films such as “Blade Runner” and “The Fifth Element” tended to present fairly dark, dystopic environments. In part, many of the early dystopic films used darkness as a means to mask the technical limitations of settings created with green screens and combinations of models and real urban buildings and sets. Dark dystopic settings in reality would have precluded the incorporation of photovoltaic cells as it would not have been able to function due to the highly-degraded environmental quality (air, moisture).

Films that were created in the early 2000s were able to create very credible environments as a direct result of developments in CGI technologies. “I Robot” in particular was able to blend very recognizable existing Chicago buildings and streets with a sleek set of future buildings and interiors. The realistic inclusion of shiny and reflective materials such as photovoltaic cells in film environments require better CGI technologies. Thematically, such films would most likely be utopian or at least neutral in terms of the condition of the environment.

The release dates of the aforementioned films are critical to their position in terms of environmental questions and solutions. Environmental awareness regarding global warming, depletion of fossil fuel resources and the potential impacts on society had not come to the political forefront at the time of production. Renewable energy methods were very much in their infancy at the time and it is not surprising to see their absence in the visualization of future scenarios. The green building movement would only truly have gained widespread, commercial awareness towards the middle or end of the first decade of this century as the implementation of green building rating systems such as LEEDTM were rolled out.

The few films that were seen to be depicting the use of wind turbines, for instance, were set in the present time. “Slow Burn” (1986) was a noir murder mystery that used the large fields of wind turbines outside of Palm Springs, California, thereby assigning the wind turbines with a negative feeling. As film genres tend to reuse popular scenarios and themes in the creation of new films, it is not surprising that the fields of turbines that are used in “The Perfect Sleep” (2009) are again assigned a setting role that raises angst (Figure 8). The setting for the film is described as “a nourish dreamscape”, assigning the fields of turbines to a dystopic vision. The motion and sound of the turbines are depicted as relentless and threatening. This type of presentation of wind energy type does little to encourage public acceptance.



Fig. 3: “The Perfect Sleep” (2009) Closing scene of the film showing the protagonist alone in a field of turbines.

5 Conclusions

The majority of studies related to the role of film in conditioning people’s perception of renewables tend to focus on what could be called more “academic” exploratory pieces rather than commercial films whose motivation lies in the generation of box office revenues. This seems to have made such films deemed unworthy of academic study. However, the impact of the latter type on society as whole is far more significant as the viewing is more extensive and thereby has more possibility in future conditioning the general public.

“Oblivion” (2013) is one of the few films, if not the only one, which directly shows images of renewable sources of energy integrated within buildings. It can be argued that adopting such approach is novel, which might be attributed to the knowledge of the filmmakers and the background of Joseph Kosinski, the director, who is an alumnus of Columbia Graduate School of Architecture, Planning and Preservation (GSAPP). This draws the attention to the architectural education Fritz Lang received and how it affected the set design of “Metropolis” (1927) which is considered as one of the most striking images of future cities in science fiction films and affected the whole genre of science fiction film set designs. It can be argued that the background of these filmmakers provided them with the relevant tools and imagination to produce credible images of future cities.

When it comes to encouraging public acceptance of the integration of forms of renewable energy into the mainstream environmental condition, this is critically important. The challenge herein lies in finding the means to encourage directors and producers to incorporate positive future visions into their films as they can play a pivotal role in forward-moving society in this direction.

In many areas of the world there is not presently widespread acceptance of the incorporation of photovoltaic cells and wind turbines into our future cities. In many cases it is dismissed because it is different or ruins the view of the landscape. If people were conditioned to see these renewable energy systems in the future version of life visualized in film, it is quite likely that they might have been more accepting of them. Thematically, film has the potential to put a very

positive spin on the use of renewable energy that could be met with less scepticism than the same advertisement if it is pitched by a local power authority or manufacturer.

Where many science fiction films have explored space or extra-terrestrial settings, most of them fail to engage renewable energy altogether. Why might this be? Likely building systems are well beyond the focus or skill level of most set designers. Most were not educated in the field and if so, they were most probably not taking environmentally-focused courses. Experts are needed on board, also there is a need for the director to find engaging potential in using renewable energy in either the set or the plot. Nonetheless, informed science fiction films play an important role in examining certain predictions and offering scientific-based solutions to the problem.

In conclusion it would seem that the real significance of the image of renewable sources of energy in science fiction films lies in the failure of contemporary films to embrace the visual potential of renewable forms of energy such as photovoltaic cells and wind in the creation of utopian architectural and urban environments of the future. Given the current state of 3-D modelling software, sustainable energy solutions and the power of digital and film media, we are presented with an important opportunity such that commercially-produced science fiction films can still be used as the means to create vital future environments that demonstrate the engagement of renewable energy systems. It may be up to current graduates work in the film industry to bring this utopian vision to life.

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Islam Abohela is currently the Head of the Civil and Architectural Engineering Department at Applied Science University. Dr Abohela is a Senior Fellow of the Higher Education Academy (SFHEA) in the UK. He is a registered Architect with solid experience in research and teaching building science and architectural engineering related modules. His research interests focus on implementing simulation tools in understanding building physics, energy performance in buildings, retrofitting micro renewable sources of energy in urban areas and effect of behavioral interventions on energy consumption in buildings, in addition to investigating the relationship between film and architecture. His teaching and research supervision experience covers undergraduate, postgraduate and doctorate students. Based on his experience in academia and industry, he provides professional consultative services to industry.