Chapter 15

Digital Moving Image Installations and Renewable Energy: 1994–2018

Chris Meigh-Andrews

Abstract In the period between January and April 1994, while I was artist in Residence in Digital Imaging in the School of Visual Arts, Music and Publishing at Oxford Brookes University, I developed *Perpetual Motion*, a gallery-based installation presenting a computer animation powered via a wind turbine. This early work initiated a series of installations presented within a “white cube” gallery setting and outside in the landscape in which renewable energy systems were integral to the themes and functioning of the work and to the ethos and concerns of my approach to working with moving image and sound technologies. This chapter traces the development of a significant body of work produced spanning a twenty-five-year period from this initial project to some of my most recent installations, discussing my ideas and intentions; describing the functioning and operation of the work; and identifying my influences, context and approach as well as the challenges and issues that I encountered.

Keywords Renewable energy · Solar energy · Wind turbines · Video art · Video installations · Video sculpture · Site-specific installations · Computer-generated images

15.1 Introduction

Throughout the period that I have been engaged in making moving image and sound installations, which includes all the works under discussion, I have aspired to produce works which are temporary and ephemeral. In every case, the installations involved the use of readily available objects and materials that were assembled to perform and function for a brief and finite period of time, usually simply for the period of the exhibition. The installations were subsequently disassembled and dismantled; the equipment and materials were reused or recycled whenever possible. This ethos is central to the work and to my intentions and continues to underpin my approach

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to working with renewable energy and to my engagement and use of technological systems within my work in general.

15.2 Perpetual Motion

Perpetual Motion (Fig. 15.1) was the first installation I made using a computer to produce and present a moving image. Previously images within my work had been originated using analogue video techniques, although I had increasingly made use of digital effects and non-linear editing systems during the post-production since the mid-1980s. *Perpetual Motion* was conceived for a “white cube” gallery space and intended to be viewed within what I considered at the time to be a sculptural context. As with my previous sculptural video installations *Eau d’Artifice* (1990–93), *Stream Line* (1991–94) and *Cross-Currents* (1992), I hoped the work would be encountered and interrogated conceptually, by which I mean that I intended visitors to become engaged with an exploration of the elements and components of which the work was constructed and to trace the “logic” of its presentation and functioning to reach an understanding of the ideas and concerns of the work. Over time and with hindsight, I have come to recognize that this idea was both problematic and presumptive, but

Fig. 15.1 *Perpetual Motion* (1994): Installation for computers, wind machine, wind turbine, video projector and video monitor. Funded by Southern Arts, Oxford Photography and the Ontario Ministry of Culture & Arts, Canada. (Visiting Artist Award). Copyright © Chris Meigh-Andrews, 2019

during this early period, I believed my work was sufficiently grounded in fundamental ideas and concerns as to be universally understood and decoded from “first principles”.

A basic description of *Perpetual Motion* is as follows: a digital animation of a flying kite was produced using “Adobe Photoshop” and “Macromind Director” (animation software) and displayed as a continuously repeating loop on a ceiling-mounted DC powered CRT video monitor which was connected to a 12 V battery on continuous charge via a small wind turbine. The turbine was subjected to a continuous blast of air produced by a large industrial fan at the far side of the gallery, which in turn was plugged into a conspicuously located mains socket. A second computer-processed video sequence of swaying grass was projected onto the gallery floor via a ceiling-mounted video projector.

This work was subsequently exhibited in three different venues: Oxford Brookes University and the Saw Gallery of Contemporary Art, Ottawa in 1994 and Castlefield Gallery, Manchester in 1996 with the same basic configurations and components, although each time requiring minor modifications due to the differing architectural circumstances and logistics of the venue. In all three iterations, it was of central importance that the wind machine produced a sufficient flow of air to turn the turbine and provide enough current to maintain the charge to the 12 V battery powering the CRT monitor displaying the kite sequence. This flow of air was also a significant physical presence in the gallery, both in terms of the sound and the force of the airflow, contributing to what I considered at the time to be the “sculptural” experience.

In her perceptive discussion of the installation for the exhibition catalogue, the curator Lowena Faull identified many of the key ideas and tensions behind the work:

Perpetual Motion uses space in an intelligent way- using the dimensions of the gallery to create a sculptural installation which poses a series of relationships between the viewer, the physical presence of the objects and the technologies at work in the piece. There is a flow of the viewer's imagination as s/he makes associative leaps between the wind machine driving the turbine and the image of the kite on the monitor. Meigh-Andrews has left creative gaps in his work, so that the audience is left to create a simple technical narrative- how it all works- and to create a narrative of meaning within the work itself.....the effect is both meditative and engaging....This is a circuit of energy, imagination and visual representation through which the artist comments on the representation of landscape, the desire of both art and science to represent and imitate the natural world, to force from its disorder, structure, to take its structures and create a more perfect replica. If there is an implied synergy / dependency / inspiration between nature and the machine- there is also an implied critique of that relationship [1].

15.3 Fire, Ice & Steam

In 1995, I was given the opportunity to develop a new work for the Middlesbrough Gallery while engaged in an artist's residency in Cleveland, North Yorkshire. The installation of *Fire, Ice & Steam* (Fig. 15.2) occupied three linked spaces in the Middlesbrough Art Gallery, and although following on from *Perpetual Motion*, I

Fig. 15.2 *Fire, Ice & Steam* (1995): Installation for solar panels, halogen lamps and LCD screen. Funded by Northern Arts and the UK Foundation for Sport and Art. Copyright © Chris Meigh-Andrews, 2019

was keen to continue developing new work featuring renewable energy components, only one of the rooms in the exhibition featured solar panels. As the focus of this chapter is on the development of my work with renewable energy systems, I will restrict my description to this aspect of the installation. The display in this room consisted of four framed and wall-mounted photovoltaic panels, connected to a 12 V “deep-cycle” battery powering a miniature LCD screen, displaying a repeating time-lapse forward/reverse video loop of melting and refreezing ice cubes. The melting and reforming ice was arranged to represent the written phrase “that time”. Each of the four walls of the room containing a framed solar panel was lit by powerful spotlights timed to switch on and off alternately, so that the light would sequentially rotate in a clockwise manner around the space across the day during the period while the gallery was open. The inspiration for this three-part installation was related to the industrial heritage of the region, and I was keen that the work was understood to be a representation of the complex and dynamic relationship between energy, light and time.

This work provided me with my first opportunity to explore the potential of solar panels as a sculptural element within a gallery installation and provided the initial inspiration for further research. However, although the challenge of developing a work using the energy produced by photovoltaic panels in *Fire, Ice & Steam* led to further ideas, other installations took precedence (*Vortex*:1995 and *Mind’s Eye*:1996, see <http://www.meigh-andrews.com/installations>), and it was not until 1998 that I

obtained the opportunity and the funding to develop *Mothlight*, a new installation involving renewable energy.

15.4 Mothlight

My starting point for *Mothlight* (Fig. 15.3) was an apocryphal story about the origins of the term “bug in the system” to describe problems associated with computer programming. According to the version of the story I came across, an early prototype computer system at the computer lab at M.I.T. in Boston developed an operational fault. Because the room-size machine’s electronic valves needed to be kept cool during the long hours of calculation, all the windows in the lab housing the machine had to be kept open and during the night flying insects had entered the room, adversely affecting the operation of the computer. The engineer’s log for that particular day included a description of the fault as being due to “bugs” in the apparatus, and according to the story the log had even included the insect in question—a moth, carefully preserved between the pages! The flying insects in *Mothlight* were computer-generated, intentionally making what I considered to be an ironic reference to this bit of scientific history, alluding to the uneasy relationship between the natural and the technological worlds.

Fig. 15.3 *Mothlight* (1998): Installation for solar panels, halogen lamps and CRT Monitors), Funded by North West Arts, with support from the University of Central Lancashire. Copyright © C. Meigh-Andrews, 2019

Fig. 15.4 *Mothlight*, Rich Women of Zurich, London 1998. Copyright © Chris Meigh-Andrews, 2019

The decision to produce a computer-generated artificial moth was inspired by this story, but it was also in keeping with my approach to representation in previous works. (For example *Eau d'artifice* (1990), an electronic fountain created from separately recorded elements playing out over a simulated “day”; *Streamline* (1991), an artificial stream made of nine separate but related sequences pieced together to form a “narrative”, or the previously mentioned *Perpetual Motion* (1994) in which kite, clouds, sky and grass were electronically combined to suggest a landscape.) In these installations, themes of conflict and interrelationships between the natural and artificial—“the made and the born”; between technology and nature—were at the heart of much of my video work during this period. This review, published in an Italian issue of “Flash Art”, identifies this relationship between the natural and the artificial, suggesting an engagement with the transmutation of matter, and picks up on both my fascination with creating parallels between the flow of matter and the flow of thought that had been inspired by my interest in the ideas of the physicist and philosopher David Bohm (1917–1994) [2].

In his research, (Meigh-Andrews) grew increasingly interested in natural images transfigured through a series of manipulations which create an artificial, alchemical world. The installations of the 90s focus, lastly, on a fundamental topic – the physic flux and its parallelism with the mental flux, and the possibility that one activates the other. The installation

*at Calci plays on this twofold aspect – some halogen lamps illuminate four solar panels which feed some monitors which generate some moths. The whole process is an infinite cycle that the spectator mentally builds through a linear series of logical passages. The thinking flux also establishes a connection among spatially discontinuous elements. **Mothlight** puts forward another characteristic also present in other works of the artist – the search for contradiction, specifically the “ironic” exploitation of alternative energy. The viewer that has patiently reconstructed the path of energy cannot miss the fact that the solar panels are fed by the halogen lamps [3].*

My video installation work at this time involved both sculpture and the moving image in interrelationship. In *Mothlight*, I sought ways to highlight the interdependence of the elements which were the core of the work—the repeating cycle of the fluttering moths and the suspended solar-powered video screens illuminated by the halogen lamps were all connected to form an interrelated cycle of meaning. The light was an important theme in this piece—illuminating, powering and conceptually connecting the images and objects within the work.

As stated above, my interest in the relationship between technology and nature was a major concern. In *Mothlight* the use of “renewable resources” was intended to be subversive. The solar panels were not used to generate electricity but to act as passive conductors which were transducing light from the domestic mains power-point. In my thinking at the time, I felt that by inverting the “conventional” application of renewable energy with electricity, I was serving the poetic rather than the technological.

The structure of *Mothlight* was an attempt to make a work that suggested both balance and movement, and I attempted to make the mobility of the linked elements clearly visible insofar as was practically possible. The various elements which constituted the work were held in a physical balance—the solar panels, the illuminating lamps, and the video screens were arranged in counterbalance, in an attempt to make the physical balance echo the conceptual balance of the interrelated elements.

The whole work was also of course a play on the idea of a “mobile”, and I wanted to make reference to the image of the moth as an illusion of mobility. The animated insect was tied to a predictable and endlessly repeating flight path, tethered as much as the various functioning physical elements of the work were constrained by the trailing cables and its relationship to the forces of gravity, and this illusion of movement was at the heart of the piece. The video monitors were placed in such a way that the viewer accepted (even if she/he knew better) the possibility that the moth was flying across the gallery space—flitting from one suspended screen to the other, and this was reinforced by a panning soundtrack and by the movement of the animation through the illusory space of the TV screen. I also observed that it might be possible to see the fluttering moth sequence as a reference to the flickering origins of the film and video image itself and had aspirations that the work could be read as a set of “nested” illusions—starting with the flickering origins of moving-image technology and outwards through the illusion of movement via the mechanics of perspective (both sound and picture) to the illusion of the mechanical mobility of the sculptural form of the entire installation.

Mothlight was exhibited on three separate occasions: the Museum of Natural History in Pisa, Italy; the Glass Box Gallery at the University of Salford, Manchester; and the Rich Women of Zurich, Hatton Garden, London. Each installation was presented in the same basic configuration, but with minor modifications to accommodate the architectural and logistics of the different venues. Each gallery required some adaptations and adjustments—some technical, others more practical. For example, the Natural History Museum, located just outside Pisa in Calchi, was exhibited in a space with an ancient ceiling and required a special fixing to be installed to support the combined weight of the installation. In the Glass Box Gallery, the work could only be viewed from outside the gallery through large windows on four sides of the space. As the work was completely contained within this space, the buildup of heat from the halogen light sources caused a significant voltage drop from the solar panels necessitating the hiring of a portable air conditioning unit. At the Rich Women of Zurich, the length of mobile support arms had to be modified to fit the gallery space.

In 2001 a variation of this installation was developed for the 291 gallery in Hackney, London, replacing the CRT monitors with data projectors displaying the moth flight sequences onto suspended sheets of translucent glass. The images of the moth were sent via infrared to the projectors, and the transmitters were powered via the solar panels, which I considered at the time added a further conceptual level to the work, making a feature of the video signal “flying” through space from its source to reach the screen. The scale of *Mothlight II* was more substantial and the greater ceiling height in the 291 gallery provided an opportunity for a more monumental installation, while retaining its ephemerality.

15.5 For William Henry Fox Talbot (The Pencil of Nature)

In 2002, I had the opportunity to realize a project that I had been considering for several years. In response to an invitation to make a new work for “Digital Responses” a group exhibition at the Victoria and Albert Museum, London, I proposed to install a solar-powered live video camera at Lacock Abbey, in Wiltshire—the former home of the pioneering scientist and inventor William Henry Fox Talbot. Electricity produced from a solar panel was harnessed to power a digital video camera focused on the large latticed window which had first been photographed by Fox Talbot in August 1835. The image from the camera was composed to exactly reproduce Fox Talbot’s pioneering “photogenic drawing”, the world’s earliest surviving photograph. This digital facsimile was relayed via an ISDN phone line to the V & A, the resultant “live” digital image of the window presenting a full-size image of the window in “real time”. This digital replica of the oriel window at Lacock was presented in a special display beside an original copy Fox Talbot’s book, *The Pencil of Nature* (Longman, Brown, Green & Longmans, London, 1844), the worlds’ first book to be illustrated with photographs (Fig. 15.5). Researcher and curator Vince Dziekan described his encounter with the work when it was installed at the Victoria and Albert Museum in his essay “*Distributed Aesthetics and the Tele-image*”:

Fig. 15.5 *For William Henry Fox Talbot (The Pencil of Nature)*, (2002): Site-specific installation for solar panel, video camera, ISDN phone line, and data projector.) A site-specific installation for “Digital Responses”, Victoria & Albert Museum, London, Sept-Oct. 2002. Curated by Paul Coldwell. Technical Consultants: David Dorrington (Internet) and Richard Monkhouse (Solar energy). Funded by The University of Central Lancashire, The Arts & Humanities Research Board and the London Institute with sponsorship from Canon UK, Solar Century PLC, with support from British Telecom, Bow Arts Trust and The National Trust. Copyright © Chris Meigh-Andrews, 2019

*At first, this fleeting projection could just as easily be dismissed as a case of the morning light outside being cast through the windows lining the length of this narrow gallery. Upon closer inspection, however, the shadow play seemed uncannily to re-enact the exact characteristics of this famous photographic image. To refer to this digital image as a representation seems a somewhat inadequate description in that the image gently playing on the wall surface I was facing involved the direct transmission of the light passing at that very moment, not through the windows in the very room in which I was standing, but through the actual windows of Lacock Abbey in Wiltshire, near Bath in the west of England. Titled, *For William Henry Fox Talbot (The Pencil of Nature)*, the work was an exact re-composition of Fox Talbot’s famous ‘photogenic drawing’, here captured by a solar-powered digital camera and relayed ‘live’ via an ISDN phone line to the gallery in South Kensington, where it was presented at actual size in ‘real time’ [4].*

With this installation, I wanted to imply the complex web of interrelationships between art, technology, light, time and physical space and reference the origins of photographic imaging and the nature and significance of light and vision and its relationship to the flow of communication systems and to the interconnecting of two geographically separate sites. The work sought to build on ideas developed in previous installations such as *Perpetual Motion* and *Mothlight* which presented “renewable energy” as a metaphor. In this new work, the daylight at the site of

Fig. 15.6 The author setting up the video camera, Lacock Abbey, Wilshire. Copyright © Chris Meigh-Andrews, 2019

the abbey passing through the historic and culturally significant window at Lacock Abbey set the entire work in motion, reflecting my intention to present an installation in which the past, present and future were linked electronically, geographically and conceptually.

15.6 Interwoven Motion

At the edge of a wooded area in Grizedale Forest, Cumbria, overlooking Coniston Water in the English Lakes, a large tree was temporarily equipped with four video surveillance cameras arranged in a circular formation around the trunk at the height of approximately eight metres. The images produced by the four cameras were relayed via a switcher to a weatherproof LCD video display mounted at the base of the tree. The speed and direction of the camera image flow was determined by the velocity and direction of the wind. The entire system was powered by a wind turbine extended beyond the height of the forest canopy and four solar panels which were mounted within the tree itself (Fig. 15.9).

Since beginning this period of work to develop renewable energy installations, all of the works I had developed were necessarily intended to be for interior locations, but for some time I had wanted to make an outdoor video installation that responded to its environment [5]. Working with video artist Catherine Elwes and engineer Dr.

Fig. 15.7 Richard Monkhouse and the author on the roof of Lacock Abbey. Copyright © Chris Meigh-Andrews, 2019

John Calderbank in the early 1990s, I had conducted a period of research into the feasibility of building a permanent outdoor video sculpture for the Chiltern Sculpture Trail at Cowleaze Wood in Oxfordshire, although this early project did not proceed beyond the report stage [6].

The notion of constructing an outdoor video installation in the landscape contained many of the contrasting and contradictory aspects that I enjoyed working with at the time and which continue to some extent in my most recent works. *Interwoven Motion* juxtaposed the natural and the artificial and made use of technology which was intended for interior use placed outdoors. I was interested in finding ways to contrast the strength and fragility of the technology with the durability and vulnerability of the tree it was temporarily connected to and the landscape it was part of. I was also interested in highlighting and contrasting different notions of temporality, permanence and impermanence. The specific video images produced by the installation were in themselves of no direct consequence—they were simply part of a flow of very subtly changing ephemeral moments. For me, the relationship between the light and the wind was at the core of the work. The light and wind provided the

Fig. 15.8 *Interwoven Motion*, Grizedale Forest, Cumbria, (2004). Copyright © Chris Meigh-Andrews, 2019

source of the images both in terms of the generation of the electrical power which supported the video and electronic apparatus and in terms of the direct physical and visual experience which become part of the work. (Day/night, ambient light and the movement of clouds, and foliage, the changing weather conditions, etc.)

It should also be noted that the work itself, like the image-sequences it produced, was transient. The components which constituted the work were temporarily clamped to a living tree for a period of ten days. The various bits of inexpensive technology—wind turbine, solar panels, video cameras, image switcher, LCD video display, cabling, etc.—were temporary modifications, which, once removed, left no trace. During the period in which the prototype installation was functioning, it was left running night and day for as long as the technical systems remained operational. Designed to be self-powering as long as the weather conditions provided sustaining light and wind, the installation was equipped with two large-capacity rechargeable batteries capable of powering the installation for approximately 72 hours. Located on Forestry Commission land, it was relatively inaccessible except via an unpaved road. From the distance, the solar panels and the wind turbine would certainly have aroused the attention of curious by-passers. However, the casual visitor coming across the installation would find no explanation or context for the piece, what it was, why it

Fig. 15.9 *Interwoven Motion*, (2004): Outdoor site-specific installation for four cameras, wind turbine and solar panels. Commissioned for “ITEM”, Funded by the National Endowment for Science, Technology and the Arts (NESTA) and Arts Council, England for The Foundation for Art and Creative Technology (FACT) Liverpool, with support from Grizedale Arts, Wind and Sun Ltd. and the Forestry Commission. Consulting Engineer, Dr. John Calderbank. Copyright © Chris Meigh-Andrews, 2019

was there, or what purpose it might have. Visitors were free to respond (or not) and to offer up their own explanation for its existence.

The location of the prototype outdoor video piece at Lawson Park was significant, as the site was on land once owned by John Ruskin, the influential Victorian English writer and critic. Ruskin’s passionate enthusiasm for the landscape of this area is well-documented, not least in his published lectures and prolific diaries. His detailed and evocative descriptions of the ceaselessly changing views of the “Old Man” above Coniston Water and of the cloud formations and vivid skies provided me with a compelling sense of this dynamic landscape—and provided me with a title for the work:

*From the west the wind blows fiercely towards you out of the blue sky. Under the blue space is a flattened dome of earth-cloud clinging to, and altogether masquing the form of, the mountain, known as the Old Man of Coniston. The top of that dome of cloud is two thousand eight hundred feet above the sea, the mountain two thousand six hundred, the cloud lying two hundred feet deep on it. Behind it, westward and seaward, all’s clear; but when the wind out of that blue clearness comes over the ridge of the earth-cloud, at that moment and that line, its own moisture congeals into these white—I believe, ice-clouds; threads, and meshes, and tresses, and tapestries, flying, failing, melting, reappearing; spinning and unspinning themselves, coiling and uncoiling, winding and unwinding, faster than eye or thought can follow: and through all their dazzling maze of frosty filaments shines a painted window in palpitation; its pulses of colour **interwoven in motion**, intermittent in fire,—emerald and ruby and pale purple and violet melting into a blue that is not of the sky, but of*

the sunbeam;—purer than the crystal, softer than the rainbow, and brighter than the snow [7].

Ruskin's vivid perception and appreciation of the lakeland landscape provided me with a powerful connection to the cultural history of the site and was an important element within the context of the work, deeply connected to a sense of its location. At that time, I saw this project as the first step towards the goal of creating a landscape installation that was an integral part of the landscape in which it was sited, responding directly to and in relation to its location, which remains an aspiration to this day [8].

15.7 Resurrection

The subsequent invitation to produce and exhibit an installation incorporating renewable energy was once again within a gallery context and I took the opportunity to develop a companion piece to the recently completed *Interwoven Motion*. A description of the elements and structure of the installation may help to visualize the work (Fig. 15.10).

Fig. 15.10 *Resurrection*, (2005–06): Site-specific installation for solar panels, DVD player and data projector. Commissioned for “Digital Discourse”, curated by Vincent Briffa, St. James Cavalier Centre of Creativity, during the Commonwealth Heads of Government Meeting, (CHOGM), Valletta, Malta. Funding from the British Council and support from the University of Central Lancashire. Copyright © Chris Meigh-Andrews, 2019

A dead tree, complete with roots (approximately twenty feet high), was cut in half, the root end mounted in the centre of the floor at one end of a rectangular gallery space. The upturned tree and roots were lit by halogen lamps, casting strong shadows on the opposite gallery wall. Over forty individual miniature solar panels were arranged irregularly on the roots and connected in series, the wires grouped and bundled and flowing down the trunk and in a cluster along the floor towards the centre of the gallery. The clustered cables were connected via a junction box and through a regulator to a twelve volt battery positioned in the centre of the space. The battery was connected in turn to a DC powered DVD player.

The top half of the tree was mounted in the centre of the ceiling pointing downward, its branches reaching down towards the floor with numerous small rectangular sheets of heavy white paper fixed to the branches, arranged to resemble leaves. A data projector mounted on the ceiling at the opposite end of the gallery was fed a continuously cycling pre-recorded video sequence of the original living tree, complete with leaves stirred by a fresh breeze. The sound of the wind in the leaves filled the space and the projected image created a strong silhouette of the upturned tree on the gallery wall.

This new gallery installation, entitled *Resurrection*, drew directly on the experience of building *Interwoven Motion*, bringing both the technological and the natural elements back into the “white cube” gallery space to create a companion piece. The living tree of the Grizedale project was conjured up in a revived form within the interior of the gallery.

The video images of the fluttering leaves in *Resurrection* presented a record of a previously living existence, recreated via technology. The electrical energy used to bring the resurrected tree back to life was transformed within the gallery space from electricity to light and back again and the shimmering leaves were experienced as both light reflectors and light receptors, the solar panels as both surrogate leaves and transforming technology.

Resurrection was developed from the knowledge gained through the development and making of previous works and shared many of the same conceptual concerns (and components). In retrospect, it was a refinement of my approach to previous gallery-based installations made prior to *Interwoven Motion* because it offered gallery visitors a more pronounced sculptural experience. The technical and functional aspects of the work were more integral to the spatial arrangement of the sculptural components. In this sense, *Resurrection* was more akin to my aspirations with *Mothlight* and *Perpetual Motion* and my earlier non-renewable installations such as *StreamLine* in which I was conscious of the relationship to the architectural space of the gallery and intent on achieving a balance between the metaphorical “function” of the technical components and a perceptual (haptic) experience within the exhibition space.

15.8 Sunbeam

The environmental burden of electronic equipment, in terms of resources, manufacture, energy use and waste has become a matter of concern for artists working with this equipment. Some have developed works that variously recycle old technologies or decline to take their power from the grid. Thus, Chris Meigh-Andrews' SunBeam uses a solar-tracking array (photovoltaic cells that follow the sun's arc during the day) to power a night-time projection of processed images from NASA's Solar Dynamics Agency, the content and the process matching. The piece appeals to a cultural history of solar energy and the symbolic power of plants, like the daisy and the sunflower, that track diurnal rhythms in their behavior and growth [9].

I had been fascinated by the large tracking solar array installed adjacent to the School of Dentistry at the University of Central Lancashire in Preston ever since they had been installed in 2009. This solar array was able to track the sun as it moved across the sky during daylight hours, substantially increasing its efficiency [10]. During discussions with Dr. Robert Walsh, director of research at the Jeremiah Horrocks Institute for Astrophysics and Supercomputing who was seeking ways to publicize the institute's work with NASA's Solar Dynamics Observatory, I suggested that we harness the energy from the solar array to produce a series of evening projections of the high-definition images of the sun produced by the observatory. My proposal was to draw energy collected during the day to project images of the sun back onto the surface of the array itself in a reversal of the process. Tests during the development stage of the project revealed that this would require covering the panels with a reflective material during the evening to provide an image of sufficient brightness to be visible. The project would also require a high-powered data projector and local police clearance to allow the images to be projected from the building across a busy road from the array. For the screen, I ordered a custom-made PVC sheet large enough to cover the surface of one of the two solar panels and this was installed using a large hydraulic lift. At dusk on the evening of each event, the covered solar array was rotated to face the university building directly across the road in which a Christie high-definition video projector was installed on the third floor. Edited time-lapse high-definition video sequences were projected onto the array on four consecutive nights, drawing considerable crowds and providing a spectacular demonstration of the power and majesty of the sun and of the university's collaborative research initiatives (Fig. 15.11).

My own aspirations for this work extended beyond this and were related to ideas and concerns that link it to my previous renewable energy installation projects. As Charlie Gere, professor of media theory and history at the Lancaster Institute for the Contemporary Arts at the University of Lancaster, has observed, *SunBeam* brought me closer to my conceptual goal of producing a technological artwork which attempts to integrate the source of its energy with the images it presents, to celebrate the harmonious relationship between light, energy and the fluid nature of matter in general:

In SunBeam Meigh-Andrews now perhaps realises what the earlier works hinted at, an artwork which both represents the prodigious energy of the sun and performs its effects by

Fig. 15.11 *SunBeam*, (2011): Site-specific digital projection event. (Tracking Solar array, data projector.) Produced in collaboration with the Jeremiah Horrocks Institute for Astrophysics and Supercomputing, UCLan and the Solar Dynamics Observatory, (NASA). Scientific Advisor: Dr. Robert Walsh, with assistance from Dr. Stephane Regnier, David Henckel and Michael Dorricott. With support from Astley Hire. Video editing of solar sequences: Cinzia Cremona. Copyright © Chris Meigh-Andrews, 2019

using that energy to make the representation possible...That the energy harvested during the day can then be used to make an artwork possible beautifully encapsulates (Georges) Bataille's notion of art as a form of general economy exemplified in the sun itself. The system that harnesses the sun's extraordinary power for straightforward and restricted uses, such as supplying energy to the university and to the national grid, is 'detoured' to produce a work of art, or in other words something useless according to the restricted economy of reciprocity and exchange. This is, perhaps, the very definition of art itself. [11]

15.9 Aeolian Processes

Aeolian Processes I and II (Fig. 15.13) were unusual within my body of work in that renewable energy was harnessed to produce sound and neither installation included any visual imagery [12]. However, both works followed my general approach of seeking to produce a series of visual connections enabling the functioning of the work to be decoded by following the operation of the elements from which the work is constituted; hence the subtitle of the 2nd version of this work "Box Revealing

Fig. 15.12 SunBeam. Installing the temporary screen on the solar tracker, UCLan, Preston, May, 2011. Copyright © Chris Meigh-Andrews, 2019

the Sounds of its Own Making”, which makes a reference (and homage) to Robert Morris’ 1961 sculpture [13].

Both installations had a definite physical presence and the various technical components that produced the sounds were all visible and involved elements of movement and change. As with all the installations discussed in this chapter, I was interested in making a temporary sculptural object in which the visitor engages with the functioning and operation of the work in order to make sense of it. With *Aeolian Processes*, I aspired to make something which was simple, direct and compatible with the landscape ethos of its location. Both installations were comprised of similar elements and operations, although *Aeolian Processes II* is a refinement and development of the earlier work.

Aeolian Processes I was commissioned for a group exhibition to be sited in a large urban park, and consisted of a large wind chime suspended within the interior of a glasshouse which was being continuously activated by the breeze from a small domestic fan. A microphone placed close to the wind chimes picked up the sounds which were then amplified, electronically manipulated and relayed to an outdoor speaker installed on the roof of the glasshouse. All the electrical components were powered via solar panels which were also installed on the roof.

Aeolian Processes II (Box Revealing the Sound of its Own Making) used the same basic configuration of components as the previous version, but given that the work

Fig. 15.13 *Aeolian Processes I* (2013): Outdoor solar-powered sound installation, commissioned for “Art in Your Park”, Highfields Park, Nottingham, curated by Theresa Caruana, with funding from Arts Council, England. *Aeolian Processes II (Box Revealing the Sound of its Own Making)* (2014), “La Lune: Energy Producing Art”, Long Reef, New South Wales. Curated by Allan Giddy with funding from the Environmental Research Initiative for Art, College of Fine Arts, University of New South Wales, Australia. Copyright © Chris Meigh-Andrews, 2019

was commissioned for a sculpture trail intended to be viewed after dark, the interior of the glasshouse was illuminated. As the work required a more substantial power supply, the solar panels were located on a separate structure which was positioned adjacent to the glasshouse. The electronics were also refined; an echo device was incorporated into the sound processing and an improved amplification of the wind chimes enabled the sound to be heard from a greater distance.

In 2015, I began developing a series of small-scale sculptural installations under the generic title of “Impossible Objects”, motivated by an interest in making works which would not require a specific commission, purpose, venue or dedicated gallery space, and with no major funding. Although these pieces have much in common with earlier works discussed in this chapter in that they often incorporate or feature renewable energy components in order to make connections to the theme of flow, they are also more directly centred on notions of “process” as a central concern. They are “Impossible Objects” not because they cannot exist (as they clearly do), but because they make use of or refer to a process that contains a contradiction or presents an “impossible” idea. They are representations of a state or situation that cannot be achieved, except through the processes and agency of art. In this respect, I have been influenced in part by the *Mono-ha* works of the Korean artist Lee Ufan, in which there is an encounter between different materials—“a relationship

of tension” in which the work is the site of the encounter. In common with my approach to my large-scale installations, all of these “Impossible Objects” are hybrid installation/sculptures made using domestic technology; temporary assemblages are made using readily available materials and equipment. Most involve moving images and some have sound. Although there are at the point of writing five in the series, only two are relevant to the themes in this chapter.

15.10 Impossible Objects

Intended to fit onto a tabletop, *Impossible Object Number 1* consists of a symmetrical arrangement of two solar panels top lit by two anglepoise lamps (Fig. 15.14). The panels provide a continuous charge to a 12 V battery which provides the electrical energy to drive a small electric motor geared to turn a crank operating a miniature music box mechanism which repeatedly plays the first few bars of the tune from (John) Lennon’s “Imagine”. The work employs a similar ironic reference to that of my earlier large-scale installations *Mothlight* and *Mothlight II*, i.e. the notion that solar energy (or more accurately renewable energy as a whole) will solve the current environmental crises. Although the work is perhaps more directly critical when compared to the earlier works, it is also more whimsical.

Similarly, *Impossible Object Number 2* (Fig. 15.15) continues this more directly cynical perspective with respect to the misplaced optimism regarding the role of renewables to “save the planet”. Physically, the work is more of a sculpture than an

Fig. 15.14 *Impossible Object Number 1: Imagine (No Pollution)* (2016–17). Anglepoise lamps, solar panels, battery, electric motor, music box. Funding: First Site Collectors Group Bursary, (2015). Copyright © Chris Meigh-Andrews, 2019

Fig. 15.15 *Impossible Object Number 2: Blue Sky Thinking* (2018–19). LCD screen, media player, wind turbine, battery and electric fan. Copyright © Chris Meigh-Andrews, 2019

installation. A black 92 cm × 3 cm × 8 cm wooden beam leans against a gallery wall at a 45 degree angle, with one end sitting on the floor. At the bottom end nearest the floor, a compact domestic electric fan creates the air current to turn a toy wind turbine connected to a battery powering a media player connected to a miniature LCD video monitor, which is arranged so that it must be viewed through a magnifying glass. The monitor displays an endlessly cycling video sequence of a full-size wind turbine. The video presented on the screen was recorded using a rotating mount locked to the speed of the turbine rotors, so that the surrounding landscape appears to rotate while the turbine blades remain static. As with all the other installations discussed in this chapter, both works are conspicuously plugged into the gallery's mains power supply.

These two small-scale sculptures clearly draw on the ideas, techniques and approach of the earlier installations, and although they are less ambitious in scale and execution, they were intended to be more direct in their intention and content. They might be understood as maquettes, as it would be conceivable to create larger versions of both of these pieces, and at a larger size they might be more challenging to experience in a gallery or outdoor setting and perhaps even more effective. Certain elements would need to be reconfigured and the formal arrangements would require revising and modifying, and in an upscaled format both of these “sculptures” would almost certainly, in my view become “installations”.

Fig. 15.16 *Impossible Object Number 2: Blue Sky Thinking* (2018-19), detail. Copyright © Chris Meigh-Andrews, 2019

15.11 Conclusions

Although all of the works discussed in this chapter inevitably have a level of critical engagement with the impending current environmental crises, and is therefore relevant to any reading of the work, in very few cases was this aspect my sole motivation or even my central concern. The photovoltaic panels and wind turbines in my installations and sculptures have been employed for their ability to transform or transduce energy from one form to another; from light or flowing air into electrical energy. In all of these installations, I have attempted to create or make reference to the flowing movement of matter and its parallel to the fluid movement of time. In relation to this, I wanted to find ways to create an awareness of the process of perception that takes place in the mind of the viewer while she/he actively engages with the work and participates in its potential to exist and/or function.

It seems as if there is something to be said about the terms I have used to describe the various works. I have written about “installations” because I feel that most of the work I have developed that makes use of or features renewable energy systems are works which require the visitor or viewer to engage in a kind of perceptual action—reading or following a line of thinking and making links and connections between

elements to reach a conclusion or arrive at an understanding. This could be seen as a kind of narrative activity or at least a time-based process of reading and making connections. A sculpture, on the other hand, requires that it is seen and understood—or at least perceived “all at once” as an object, and then perhaps unravelled and deconstructed, after the initial encounter.

At the point of writing this, I have tentative plans for further work to extend or continue my line of enquiry which may perhaps result in new or further successful developments. However, I believe the context of this work has changed considerably since I began making installations which included renewable energy components. The environmental issues have been brought into much sharper focus, as there is a far greater public awareness of the danger to the environment posed by the use of fossil fuels. For example, in my earliest work visitors were not always able to immediately recognize the function of the solar panels as transducers of electrical energy, but now these objects are so commonplace that they are not perceived as remarkable or intriguing and their potential as a symbolic or poetic device has been considerably eroded. This shift in consciousness makes the environmental dimension of the work too dominant, and weakens its impact and potential, and this requires that I either accept this and move on, or try to discover a new level of signification and relevance for them in my future work.

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