‘More Brent Geese than ever are visiting Bradwell’: An examination of the public-facing media messages promoting nuclear energy in the late 1950s and 1960s

Wenna Potter[1]
[1]Department of Archaeology, University of York, York, YO1 7EP, United Kingdom

Correspondence to: Wenna Potter (wenna.potter@york.ac.uk)

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Abstract. In the 1950s, rapidly increasing electricity consumption prompted the conception of an ambitious nuclear energy programme in the UK. The need for nuclear power was framed alongside continued building of coal and oil power stations but promoted as a solution to the geographical and supply issues to each respectively. The process of producing electricity from nuclear fission was unknown to many, and information on the development of nuclear energy was largely government and industry led. This paper draws together official industry media to examine how nuclear energy was promoted to the public. It will argue that aspects of the process of generating nuclear electricity were framed as exceptional and mundane to ensure public enthusiasm and support. However, the narrative of the exceptional and mundane was facilitated by the systematic omission of information throughout the dissemination process, to hide elements of contest and gatekeep knowledge to maintain the illusion. The industry promoted a narrative which could facilitate the rollout of nuclear power alongside the public trust and support.

1 A new energy source

The opening of the first large-scale civil reactors, Bradwell, Essex and Berkeley, Gloucestershire, marked the start of commercial nuclear energy production in the UK, attracting local and national attention. As a new technology, explanations of the scientific process of producing atomic energy were disseminated to the public in the 1950s and 1960s. Emphasis on the remarkability of harnessing the atom, the technological success of nuclear energy, and its potential future contribution were promoted to capture public imagination, fuelling optimism and evoking a sense of national pride. Newsreels followed the construction of early plants, emphasising the scale and size of component parts; a heat exchanger towed through small Essex villages loomed over the surrounding bungalows, as residents left their houses to watch it go by (British Pathé 1959). Atomic power was branded the incomprehensible counterpart to traditional energies, with viewers reminded that *“uranium rods develop heat…, but to all but the scientifically minded, the rest is a mystery”* (British Pathé 1966). However, this was countered with comparisons to traditional coal and oil energy production, emphasising the safety, reliability and necessity of energy production.

The United Kingdom Atomic Energy Authority was formally established in 1954 to provide a government-led research team to develop civil and military nuclear technology (Cocroft 2006, 13). The UKAEA was responsible for the initial design development and successful construction of Calder Hall and Chapelcross. Calder Hall was opened in 1956 and demonstrated that nuclear energy could be supplied to the grid on a large scale, confirming its future role in electricity provision (Taylor 2016, 11). The construction of commercial nuclear power stations passed to the Central Electricity Generating Board (est. 1958), a nationalised company established in 1958 to manage all power stations in England and Wales; the South of Scotland Electricity Board and North of Scotland Hydro-Electric Board performed the same role in Scotland (Wearne 2015, 1). These were nationalised companies which managed all types of power stations, to meet the supply needs of their respective areas (Hill 2013, 3). The management of the nuclear power programme remained with these nationalised companies and received less government intervention than may be expected (Hill 2013, 3).

This paper will explore the relationship between the nuclear industry and the general public by examining fifteen guidebooks, published to celebrate the opening of the first wave of nuclear power stations in the UK, known as the Magnox stations. The UKAEA managed Calder Hall and Chapelcross, while the Central Electricity Generating Board were responsible for the construction of Berkeley, Bradwell, Dungeness, Hinkley Point, Trawsfynydd, Oldbury, Sizewell and Wylfa, in England and Wales. The South of Scotland Electricity Board was responsible for Hunterston. All were constructed between 1956-1971 and have since ended their operational life, and are at various stages of the decommissioning process. This article is focused on the analysis of guidebooks published between 1957 and 1965 to promote and celebrate new nuclear power stations.

Each guidebook relates to a specific station, and there are often multiple booklets for each, published at a point during construction and to celebrate their early years, for consumption by the general public. Each front cover includes a drawing of the intended design or a photograph of the newly completed power station, depending on the time of publishing. While the length varies, most are between 15 and 20 pages long, often starting with a map of planned and any completed nuclear power stations, usually including the grid connection route. The guidebooks outline the national demand for electricity and the role of nuclear energy in meeting supply needs. They then provide a brief explanation of the process of generating nuclear energy, with a cutaway diagram of the reactor. The last section focuses on each individual station, providing information on the site, design and wildlife, often with photographs of the site and station under construction. The guidebooks are published by the Central Electricity Generating Board (CEGB) and South of Scotland Electricity Board (SSEB), providing a fertile opportunity to interpret the industry-led dissemination of the role of nuclear energy.

Within the guidebooks, focus was placed on electricity supply, skilled engineering, and the impact on locality, rather than the nuclear elements. For example, the continued habitation of Brent Geese at the Bradwell site is emphasised in a visitor guidebook in response to concerns raised at the initial Public Inquiry in 1958, to demonstrate the power station had not negatively impacted on the population of geese (CEGB 1962). Aspects of the electricity production process which can be seen as routine, ordinary and trusted were emphazized, acting as an example of where mundane elements were used to neutralise and offset concern, and ideas of risk relating to atomic energy. The selective omission of sections of the nuclear electricity production process, most notably uranium mining and the creation of nuclear waste, raises questions of the intended purpose of the media output.

The first section will provide a contextual basis for the discussion of the nuclear industry within 1950s and 1960s Britain, outlining the general focus on nuclear weapons, and identifying the critical shift towards establishing and challenging the political basis for heritage-making processes. The second section will identify the tactical rationalization of the need for atomic energy, which ties into the mundane energy debates, identifying practical reasons for investment in the development of the new technology. The third section will outline key omissions from guidebooks for nuclear power stations to suggest that controversial information was carefully navigated to manage and maintain public support for nuclear energy. The last section will identify instances where nature and landscape have been used to reassure the public, both of the safety of nuclear power and the position of the industry as a caretaker of land. The article argues that the electricity industry curated a national and local narrative to encourage the integration of nuclear power stations into their local communities, by framing themselves as a reliable custodian of the landscape.

2 Promoting the atom

The race to develop nuclear weapons meant that nuclear science had been kept relatively outside the public sphere, allowing little opportunity for the transfer of knowledge (Hogg 2016, 41). The bombing of Hiroshima and Nagasaki drew nuclear weapons into the spotlight and once the United Kingdom had started its own efforts to develop military and civil atomic research, a more concerted effort was made to expand the public understanding of atomic energy and to encourage support for the new technology (Laucht 2012, 591-2). Within the UK context, understanding of British nuclear narratives and the evolution of these have been studied extensively. Langhamer (2019, 219-20) studied UK emotional responses to the bombing of Hiroshima and Nagasaki in 1945 and found that while the development of the atom bomb had been seen as a symbol of future technological hope, many felt anxiety for international diplomacy, the evolution of warfare, and their future safety. A special edition of the British Journal for the History of Science (2012) aimed to examine and define ‘British nuclear culture’, which could work to unite scientific, cultural, and political strands of historical study, with regard to both civil and military aspects (Hogg and Laucht 2012, 479, 486). Hogg (2016, 17-8) explores official and unofficial perspectives to consider the social and cultural changes in relation to nuclear technology, often in connection with nuclear anxiety related to weapons development. While some found the development of the atom bomb a symbol of progress for the future which may in turn facilitate greater international diplomacy, many felt anxiety for the evolution of warfare and their future safety (Langhamer 2019, 217, 220).

In order to integrate nuclear technology into the public sphere, efforts were made to engage the public and showcase designs through the media and exhibitions. In 1947-8, the Atom Train exhibition, organised by the Atomic Scientist's Association with support from the Ministry of Supply, set out to explain atomic energy, how it worked, and its potential risks and benefits to the 'informed laymen' (Laucht 2012, 592-3). Although setting out to communicate information related to both civil uses and weapons development, Laucht (2012, 599) argues it promoted two dichotomies: one of an optimistic, nuclear utopia, and one of complete destruction The inclusion of a diagram of London, with rings to mark the potential impact of atomic weapons brought potential risk close to home, which Laucht argues evoked a sense of fear related to proliferation risk (Laucht 2012, 603-4). Here, scientists led an emotional campaign, pitting the positive nuclear dream, against a fear-driven narrative of the development of nuclear weapons by other countries. Similarly, the Exhibition of Industrial Power in Glasgow, a part of the 1951 Festival of Britain, displayed atomic energy as the grand conclusion to an exhibition celebrating British industry and innovation (Wall 2019, 246; Conekin 2003, 67). While represented as the energy source of the future, with the potential to provide limitless electricity which all other industries depend upon, references to the potential harmful power of atomic energy are briefly mentioned (Conekin 2003, 68). The polemic narrative of the 'un-dreamed of plenty' was pitted against 'whether we are working out our complete extinction', with emphasis placed on the need for peaceful uses of atomic energy (Conekin 2003, 68). A model of the GLEEP reactor featured in exhibition displays in the 1940s and 1950s, both as an educational tool and to appease growing fears over the risk of nuclear technology and radiation. Boyle (2019, 23, 26) examines the narrative shift between how the model was displayed for local audiences, compared with industrial and commercial audiences, to argue that when exhibited in local communities, efforts were made to banalize the impacts of radiation and emphasise the expertise of the research establishment to develop a sense of safety. However, in the context of the national and international exhibitions, scientific skill and innovation were the focus. Boyle (2019, 27-8) identifies strong commercial motivations and efforts to establish trade routes as a factor which informed display. Industrial and commercial aspects were promoted alongside narratives of safety and expertise, to mitigate concerns for military uses of nuclear technologies (Boyle 2019, 23, 28-9). These distinct narratives demonstrate an intention to adapt the message of the exhibition to engage support for nuclear technology by using emotional reassurances.

The development of a deliberate perception of nuclear technology was informed by political and industry efforts to produce a desired response to ensure continued support, often by evoking certain emotions. Emotional responses to nuclear energy have been identified as significant factors which affect public perspectives and attitudes towards nuclear energy (Roeser 2011, 198, 200; Keller et al. 2012, 475). The role of emotions in curating a nuclear narrative has been further explored by Sastre-Juan and Valentines-Álvarez (2019), who engaged fun and fear as prompts to elicit critical analysis of display practices and cultural interpretations of nuclear technologies. Sastre-Juan and Valentines-Álvarez (2019, 4, 6-7) argue that emotional responses to nuclear technologies have evolved alongside politically motivated management of emotions. Sastre-Juan and Valentines-Álvarez suggest that a number of affective states have been politically produced in order to mediate public emotional responses to nuclear power, functioning to advance both public support and opposition for nuclear power (Sastre-

Juan and Valentines-Álvarez 2019, 7). The dichotomy between fun and fear is offered as an example in which play has been used to create a feeling of intimacy and familiarity between nuclear technology and the general public, in order to mitigate feelings of risk and mistrust towards nearby nuclear power stations (Sastre-Juan 2019, 44, 48). The banalization of nuclear technology is paired with the developing a sense of familiarity, providing a reassuring alternative to feelings of risk and fear (Sastre-Juan 2019, 35, 48; Kasperski 2019, 51, 59-60). The idea of affective imagery is applied by Keller, Visschers and Siegrist (2012, 464, 475) as a method of understanding how emotions could impact opinions on new nuclear power, to identify that perception of risk was a significant factor which impacted support and opposition for the nuclear energy. Recognising the role of emotions in informing public opinion allows greater insight into the nuclear debate and to identify some of ways in which they could inform public opinion and emotional responses to nuclear technologies.

3 The guide to nuclear energy

3.1 A rationale for nuclear

To demonstrate the essential position of nuclear energy, the guidebooks contain arguments which portray nuclear energy as a valuable and essential part of electricity supply within the UK. Framed within the context of growing energy demand, the advantages of nuclear energy were placed alongside, and in comparison, with coal and oil to propose the three fuel economy, identifying why and where nuclear was the most appropriate selection.

The rationale for nuclear electricity was always paired with comparison to traditionally fuelled power stations, both in logistics and cost. A concerted effort was made to ensure that, while the modernity of technology was highlighted, a reasoned and economic argument was made to support the development of the new method of producing electricity. Focus was placed on the generating potential of each station, to firmly identify its contribution to the National Grid. Initially, the White Paper 'A Programme of Nuclear Power' (1955) was used as the benchmark. A year prior, the Programme of Nuclear Power 1955 had outlined the planned development of nuclear energy in the UK, identifying that the first electricity-producing reactors would be built to the design of Calder Hall, with an improved design using enriched uranium expected to be possible six years later (Ministry of Fuel and Power 1955). While Calder Hall had not yet been completed, confidence in its success had meant that twelve nuclear power stations had been commissioned for intended completion by 1965, with a joint capacity of 1500-2000 megawatts (UKAEA 1957, 17). The civil nuclear programme was promoted as an invaluable part of electricity supply within the UK, and following the Windscale Fire in 1957, required a firm marketing campaign to ensure continued public support (McMullan 2021, 1,7). The United Kingdom Atomic Energy Authority published a small guidebook on Calder Hall in 1957 to introduce the site, explain how nuclear power was produced and to outline the future nuclear programme. The success of Calder Hall was portrayed as an opportunity and a necessity, as *"The ever-growing demand for electricity, which at present is doubling approximately every ten years, is rapidly out-stripping our resources of conventional fuels, coal and oil.*

It is for this reason that the need to use nuclear power- atomic energy as it is popularly known- is so urgent" (UKAEA 1957). Following the acceptance of contracts for Berkeley, Bradwell and Hunterston in 1956, the nuclear power programme laid out in 1955 was revised in 1957. These three stations were designed to supply 900 megawatts of the 1500-2000 megawatts, showing scope for an increased output of the revised programme. The revised programme laid out plans for nineteen stations to be completed by 1965, with a joint output of 5000-6000 megawatts (UKAEA 1957).

The rapid increase in the demand for electricity following WWII was a primary cause for the nuclear energy programme. The CEGB promoted the 'Three Fuel Economy' which identified a combination of coal, oil and nuclear power stations as a method to meet the growing need for electricity (CEGB 1961). In 1963, it was suggested that: *"The electricity supply industry looks forward to a period starting about 1970, in which electricity will be generated from three economically comparable fuels- coal, oil and nuclear power. The electricity supply industry should be able to manoeuvre with reasonable freedom within this "three fuel economy" to choose the proportions of these three fuels in such a way that the minimum cost for electric power is achieved."* (CEGB 1965). The intention here was to construct three harmonious sectors of the power industry which could react to both changing electricity demand and potential risk to supply of coal and oil. The individual benefits and needs of each fuel source were considered in the siting and type of power station selected. Coal-fired power stations needed a large supply of coal daily, with plans for the modern designs expected to require 10,000 tons a day (CEGB 1963), which was therefore only feasible in areas located close to coalfields. By the early 1960s, oil-fired power stations were seen as a good option, as oil was more stable, both in supply and cost, as the oil used was the by-product of the heavy oil's industry. However, this was only cost-effective when supplied from UK refineries, and as this supply was finite, the CEGB sought to have alternatives which would not require the import of oil fuels (CEGB 1963). The Suez Crisis in 1956 had also shown the vulnerability of relying on imported fuel (Hill 2013). Nuclear power stations were positioned as an alternative which could respond to some of the issues surrounding the required close proximity to coal mines and concerns over the provision of oil. While having a strict siting criteria of their own, the small quantity of fuel needed for nuclear power meant daily transportations would not be needed and therefore, while the number of potential sites was equally limited, these locations were sufficiently different to potential coal and oil-fired power stations to be of benefit. It is worth noting here that no mention is made of hydroelectricity which was a well-established form of generation, most likely because the relative output per station was substantially lower than possible for those in the 'three fuel economy'.

Certain areas of the UK had notably high electricity demand and required increased supply (National Parks Commission 1959-61). The energy deficit in the south of England provides a good example of a situation where local supplies of coal were limited and nuclear (and some oil) power provided a valuable alternative (CEGB 1962). To further illustrate the contribution of nuclear power, the output of each nuclear power station was often related to an area close to each specific power station. This was again often framed within the context of the traditional energies, to further illustrate why nuclear was a suitable and desired alternative. For example,:

"Hunterston produces enough electricity to supply a city the size of Edinburgh and it does it at a fuel cost which is far below that of any coal or oil-fired power station built or even contemplated. Its demands on transport and storage for fuel are almost non-existent. There are no railway sidings, no chimneys, no problems of ash disposal. Instead of burning 73,000 tones of coal per month, which would be the case if Hunterston were a coal-fired power station, it uses 10 tonnes of uranium fuel- a single load for a single lorry" (SSEB 1965).

This provides a tangible and relatable visualisation of the capabilities of nuclear energy which could otherwise be detached from the public understanding. The inclusion of locality shows a desire to elicit an emotional response, converting a national argument to a local and personal one. Comparison with coal and oil is again emphasised, mostly related to the heavy infrastructure and high quantities of fuel required to maintain the operation of the power station. Here, the tons of uranium required are directly related to the tons of coal, and illustrated as a 'single load for a single lorry' per month. The logistical benefits are apparent, though there is little-to-no mention of the experimentation and development required for construction of this type.

Some reference is made to the 'clean' nature of nuclear, particularly the absence of chimneys and ash as otherwise inherent in power generation reliant on producing heat by burning fuel. Awareness of the risks of smoke pollution within cities, in part raised by the Great Smog in London (1952) had prompted some concern in relation to power generation (Hill 2013). The consortium responsible for building Berkeley nuclear power station, A.E.I John Thompson, raised the issue of smog in an advertisement promoting Berkeley, stating that: *"It is paradoxical that, in the creation of our industrial wealth, we have choked ourselves with smog. One reason why we need new sources of power is to lessen the grime of our cities. Nuclear energy promises such power"* (A.E.I John Thompson 1958). Discussion of the reduction of pollution further differentiates nuclear power, framing it as an alternative energy source which could provide a cleaner and streamlined future generation. The positionality of the CEGB, A.E.I and John Thompson Ltd. is of interest, as all three were equally involved in the construction and supply of parts respectively, to coal and oil-fired power stations. The promotion of nuclear implies a mindset that while the three fuel economy was then required, nuclear power would shift to the forefront as the technology evolved.

The justification for nuclear energy draws both on the contextual national energy demand and the limitations of traditional power generation. The need for nuclear was identified alongside a logical rationale which highlights the benefits of nuclear power, alongside and in preference to traditionally fuelled plants. However, the limitations of nuclear power are minimally, if at all, acknowledged. The capabilities of uranium are emphasised, while other aspects of nuclear energy draw upon comparison to the mundanity of electricity generation. The selective omission and downplaying of core aspects related to nuclear power are evident, and this will be discussed in the next section.

3.2 Systematic omission

Building off the White Paper 1955 and the revision in 1957, the case for nuclear energy is well-argued by the CEGB and SSEB. The logical positioning and identification of the benefits produces a strong argument for investment and development of the new method of electricity production. However, considerably less attention is given to inevitable aspects of nuclear energy which pose or remind of risk. This section will consider information omitted from official industry documents, to consider why this was not acknowledged and how this may have been applied to manage public relations.

For those looking for further detail of the process of nuclear energy, each industry-produced nuclear power station guidebook included a section, often identical, which explained the process of producing nuclear electricity (CEGB 1965; 1965; 1963). A comparatively small introductory section is given to the process of generating electricity, generally limited to the process of using steam to drive the turbines. For example, this is referred to in the Dungeness guidebook (1965) as *"nearly all of the electricity which the Generating Board produces is generated by turbo-alternators. For these steam is required to drive turbines. Nuclear power stations differ from the conventional installations in that, instead of burning coal or oil, the heat from nuclear energy is used to boil water and generate steam."* A baseline understanding of traditional electricity generation processes was therefore assumed, with the section predominantly focused on the nuclear aspects. Generally, this begins: *"to explain what happens in a nuclear power station many words are used which some of us may not fully understand. It is proposed to take such words in a certain order and by carefully defining them to present a fair idea of the general procedure."* (CEGB 1965). Atomic structure and the fission process are explained, with key words capitalised to demonstrate their significance; these included element, atoms, protons, neutrons, electrons, nucleus, nuclear fission, chain reaction and uranium (CEGB 1965; 1965; 1963). The second part includes a cross-section diagram of a reactor alongside an identification of the key components. Within the discussion of nuclear power, the complex scientific background was portrayed as something which would require a certain level of intellect to understand. The guidebooks provide the background information required to explain the process, making use of several diagrams illustrating nuclear fission, the process of generating nuclear electricity, and a cutaway of a reactor (CEGB). The omission of a detailed explanation continues to facilitate a narrative of nuclear exceptionalism through the act of simplification and gatekeeping of information. Framing the production of nuclear energy as a deeply complex process reinforces its position as a mystical, elusive and utopian energy, mediating adverse emotions for the benefit of industrial interests.

As the fuel, uranium was of course featured within the contents of the guidebooks, but this was strictly limited to the processes which occurred within the UK. Uranium is discussed only in relation to the criteria for its selection, which is described as: *"the reason for using natural uranium as a fuel is that it is the only naturally occurring material which can produce a controlled chain reaction."* (CEGB 1962). While uranium is identified as a naturally occurring element, there is no following description of where this naturally occurs or how it was accessed and supplied to the UK. One of the concerns for expanding the scope of oil-fired power stations was based on the potential import of fuel. While the quantities required are vastly different, it is still notable that there is no reference to the import of uranium. Uranium mining was a well-established industry, so it is possible pre-existing knowledge was assumed, but given the level of explanation for other aspects of the nuclear energy process this seems somewhat unlikely.

The other reference to uranium is in relation to the supply process to the power station. The guidebook for Hunterston describes the procedure as *"The natural uranium fuel comes to Hunterston fully prepared as fuel elements from the United Kingdom Atomic Energy Authority's factory at Springfields, Lancashire. When an element has served its purpose and is discharged from a reactor it will be stored under water for about 100 days to lose some of its radio-active properties and will then be returned to the U.K.A.E.A's factory at Windscale, Cumberland, where it will be processed to remove still valuable elements."* (SSEB 1965). Again, this was potentially another opportunity for the mention of the supply chain and processing of nuclear fuel. However, the description of constructing fuel rods is limited to the process which happens within the UK, without any mention of mining and import (CEGB 1965). The UK has not mined uranium; all uranium has been imported from overseas, with fuel for early reactors relying on colonial and commonwealth relations (Hill 2013). Gabrielle Hecht provides a comprehensive analysis of uranium trade between South Africa and France, with discussion of wider international diplomacy (Hecht 2012). In the UK, official UKAEA historians, Margaret Gowing and Lorna Arnold's books *Britain and Atomic Energy 1939-1945* (1964) and *Independence and Deterrence: Britain and Atomic Energy 1945-1952* (1974) detailed the official development of nuclear technology within the UK, and provide some insight into the trade relations and supply of uranium to the UK. However, Gowing and Arnold's work, while valuable, remains representative of the period in which it was written and lacks a critical account. Written as an official history, it represents an inward-facing institutional perspective which omits the perspectives of others (Gowing 1964; Gowing and Arnold 1974). An international narrative was told only as a national narrative, reinforcing a sense of patriotic pride. This is demonstrative of the position of the UK in global politics and following the Second World War, providing an interesting insight to perspectives and objectives of this time. However, while political aspects of nuclear power have been further studied since Gowing's work, many of these continue to lack detailed analysis of the uranium trade associated with British nuclear.

Within the description of nuclear fission and the process of producing nuclear energy, there is no explanation of radiation or the release of fission products. It is limited to an explanation of atomic structure, maintaining a chain reaction and identifying the key components of a reactor. Radiation was only referred to in the guidebooks in relation to protective design features. It is unclear how much the audience would be aware of radiation risk, but given the detail provided on other aspects of the process, the omission of an explanation of the creation and risk of radiation is notable. While radiation and the associated risks are never explained, references to the precautions and management of radiation are periodically referred to during sections which discuss the detail of design. For example, within the Dungeness guidebook (and similar in others) the role of shielding and layout of the site to minimise radiation exposure was referred to as: *"For convenience in boiler operation all the main* *feed and steam valves are located beyond the boiler shielding walls. These walls not only provide shielding for local operation but also reduce the radiation level on site, and in particular near the control room."* (CEGB 1965). The layout of the site and use of shielding were offered as examples of mitigating risk across the site. Continually referring to safety precautions, with the omission of direct reference to risk, illustrates an image of the benign; radiation exists but it is not a threat. This is similarly seen in the discussion of the function of cooling ponds, which states: *"The ancillary buildings attached to the station include a cooling pond in which irradiated fuel elements discharged from the reactor can be stored for months to allow the high intensity radiation to die down before they are transported to the United Kingdom Energy Authority's chemical factory for processing."* (CEGB 1962). The idea that fuel 'can' rather than 'needs' to be stored for prolonged periods in the cooling pond suggests this acts as a preventative safeguard. It is also likely that the difference between 'high intensity radiation' and the radiation level suitable for transport means very little to the reader, given the lack of explanation of radiation. Within the guidebooks, no mention is made of radioactive decay or the half-life of irradiated material. If these guidebooks were your sole introduction to nuclear energy, there is a large side of the scientific background left unexplained.

In terms of safety, each design was a revision of the last, with the gradual evolution of technology to ensure ease of operation and safety of design. Included in a guidebook for Dungeness (1965) was a reference to: *"the revised requirements for limiting the building-up of Wigner energy in the moderator implied a substantial increase in the graphite operating temperature, and the most certain way of meeting these requirements was to increase the gas temperature at the inlet to the reactor."* (CEGB 1965). This section is included within a large section providing more detail on reactor design, which credits adaptations in engineering. No direct reference is made to the Windscale Fire 1957, in which a build-up of Wigner energy caused Pile 1 to catch fire and resulted in the UKs worst nuclear accident (Hill 2013). For those with prior knowledge of the Windscale Fire, reference to safety precautions relating to Wigner energy shows acknowledgment of the accident and demonstrates relevant changes have been made to mitigate risk. However, as no direct reference to the accident is made, the recent example of nuclear accident is not revisited, and thus does not raise any further concerns for safety, suggesting careful navigation of the political context. Wigner energy is also referred to in relation to the design at Hunterston: *"In the Hunterston design each individual fuel element is contained, and separately supported, within a graphite sleeve. This provision gives, among other benefits, automatic protection against the build-up of Wigner energy, a phenomenon which can cause sudden overheating within the reactor."* (SSEB 1965). Maintaining distance from the Windscale fire, while attempting to draw separation from the accident, may also be an effort to distance the civil nuclear programme from the military. The Windscale piles were known military reactors used for the production of weapons-grade plutonium for the United Kingdom Atomic Energy Authority. While the civil nuclear programme rested in reactor design developed for producing plutonium for atomic weapons, there was no mention of these origins within the guidebooks.

It is unsurprising that the Windscale Fire and the atomic weapons programme are not referred to, but the distance maintained from both is noticeable. Aspects of nuclear energy generation which may cause concern or justification for criticism were systematically omitted from the guidebook, suggesting intent to produce a favourable perspective on nuclear energy. Elements of the process which could be deemed 'exceptional' or specific to nuclear, such as uranium mining or radiation were positioned alongside practical and safety measures, emphasising the banality and minimising the distinct features of nuclear energy.

3.3 Flora and fauna

During the siting process, the impact of large-scale industry on the local environment was highlighted as a main concern. The need for rural locations meant the sites selected were often of high value, both in terms of conservation and aesthetics, and with low populations and surrounding industry. Consideration of the aesthetic, or amenity, value of the landscape was a main topic of discussion with extensive investment in landscaping and architectural design of the sites to aid integration of industry into the countryside (Cocroft 2006; Csepely-Knorr 2022; 2021). Kasperski (2019, 60-1) notes the common depiction of nuclear power stations with nature, in part industry-led, suggesting that this offers a sense of familiarity and reassurance, and even frames nature as a mother or protection figure to safeguard local communities.

The disruption caused by construction work and ongoing operation of the site were considered a risk to the continued successful habitation of many types of flora and fauna, often unique to each area. Reference to the natural environment featured in many official publications, sometimes with direct reference to public concerns. For example, the guidebook for Bradwell, published in 1962, concluded by stating: *"At the Ministerial inquiry with the Generating Board's application to build a power station at Bradwell fears were expressed that the Brent Geese which visit that part of England would be disturbed by the building work and disappear. The birds remain unaffected. According to some reports more Brent Geese than ever are visiting Bradwell".* (CEGB 1962). Brent Geese are migratory, generally travelling from Russia, Siberia, Svalbard and Greenland to winter in the UK from October to March (Wildlife Trust 2025). Those found in the South East of England are generally from Russia and Siberia, distinct by their darker colouring (Wildlife Trust 2025). The population of Brent geese were a main discussion point in the siting of Bradwell due to their protected status, and the risk to their habitat and food supply which the construction and operation of Bradwell may cause. In the Inquiry, the Royal Society for the Protection of Birds had highlighted the significance of the Dengie Peninsula and the Blackwater Estuary as an area for the habitation of a significant number of Brent geese. By acknowledging the previous concerns of the public inquiry, the CEGB provided the opportunity to address potential criticism and provide reassurance to the public regarding the impact of the new nuclear power station. It is unclear what information had informed this statement as no evidence was provided making it impossible to directly trace the source. Reassurances for the Brent Geese may also appear premature, as the guidebook in question was published when Bradwell was still under construction. At the Bradwell Inquiry, while some concerns for the geese were focused on disruption during the period of construction, these were more heavily focused on the impact of warm effluent on food supplies which would not have affected the wellbeing of the geese until after operation had begun (Grimmitt 1956). However, the hasty reassurances of the CEGB show a desire to demonstrate harmonious co-habitation of industry and nature in an effort to neutralise public concerns. The inclusion of nature goes beyond showing care for the environment, by referring to the continued normality for the area.

A similar sentiment is demonstrated in relation to Dungeness, located on a depositional shingle spit which meant the land has become gradually more exposed over time as sediment had built up. This allowed a microhabitat to evolve which did not include invasive and dominant species, and supported the survival of a number of rare plants and insects (Nature Conservancy 1958). An extensive reference to this is made within the Dungeness guidebook 1965, stating that: *"Dungeness is a unique shingle depositional feature and has many unusual mosses, lichens and other plants and also has several rare insect colonies, apart from which it is one of the major crossroads of bird migration routes. The area has considerable interest for naturalists and physiographists and special measures were taken by the Board to minimise any disturbance to the natural life and surface features. In conjunction with the Royal Society for the Protection of Birds, a local warden was appointed to protect these interests and close liaison with the Board's resident engineer established even before any construction work started*." (CEGB 1965). The efforts made by the CEGB to ensure minimal disruption show an awareness and appreciation of the unique value of the land, and its inclusion in the guidebook emphasises this care to the public. Here the industry is portrayed almost as a custodian of the land, working collaboratively to protect the landscape, alongside meeting increasing energy demand. Kasperski (2019, 60-1) notes the frequent industry-led depiction of NPPs entwined with nature and suggests that this is often mirrored in children's artistic imaginings of NPPs. Kasperski proposes that industry encourage this narrative as it offers a sense of familiarity and reassurance, and even frames nature as a mothering or protection figure to safeguard local communities. The value of nature to offer reassurances for nuclear energy has been frequently used across nuclear publications, demonstrating the interconnectedness between nuclear sites and their landscapes.

Similarly, a new lighthouse was built in Dungeness (1961) as the previous version would be eclipsed by the power station. This was portrayed as an investment in the area and community, with the switch to an automated system emphasised as a shift towards 'progress'. Trinity House, a charity attached to the General Lighthouse Authority, reported that the lighthouse has been spotlit since 1962 which has reduced the high mortality rate of migratory birds (Trinity House 2025). Although this decision was made prior to the release of the guidebook, no reference is made to this incident, despite the fact that efforts were made to prevent continuing bird death. This reinforces the narrative that information which could be taken and critiqued was omitted from inclusion, rather than acknowledged.

The strict siting criteria meant many nuclear power stations were built in sensitive locations, and extensive architectural and landscaping treatment was applied to mitigate risk to the amenity value of land. Efforts made to integrate the power station with the land to cause minimal disruption were frequently reported on in the guidebooks. For example: *"Opinion was tested in a lengthy public inquiry in the course of which it was agreed on all sides that the amenity of Hunterston, both public and private, was of very great value and merited the most anxious consideration…Today's buildings are indeed* *very fine. Despite their size they blend with their magnificent surroundings like a sundial in a country garden. On this world-famous stretch of the Clyde they have become something of a tourist attraction."* (SSEB 1965). While emphasising the serious consideration given to concerns raised at the public inquiry, the guidebook suggests that, if anything, the power station had added value to the area. Hunterston is almost compared to the 'world famous stretch of the Clyde', with the power station viewed as the tourist attraction over the natural beauty of the area, suggesting that mankind had built something which rivalled nature. This idea draws back to initial ideas of 'harnessing the atom' which dominated the 1950s and 1960s, a technological era of atomic power and the race for space. Nuclear energy is placed on a pedestal to be marvelled at, but never quite understood.

4 A nuclear narrative

As publications of the electricity industry, it is expected that a positive depiction of nuclear energy is conveyed in order to advance their commercial prospects. Framed as an educational and local interest resource, the guidebooks show nuclear energy as safe and necessary, carefully planned and constructed by a paternalistic state company concerned only with the reliable supply of energy.

The guidebooks initially draw on a national argument, to show that nuclear energy is essential to providing a stable electricity supply. The development of the technology is centred around British research, with small references in the fuel supply making it clear that the industry is supported through a British supply chain. A narrative of national self-sufficiency is thread throughout, offering a place for patriotic pride for the development of the nuclear programme.

This national narrative relies on the omission of the international supply of uranium and reference to external research collaboration. The UK power stations are not framed within an international context, and discussion of atomic research carefully navigates around its military origins. However, this is by no means a unique to the UK; in a guidebook for Peach Bottom (1960s), its 'atomic timetable' jumps from Fermi's first chain reaction at Chicago Pile-1 in 1942, to the US's first instance of electricity generated from nuclear power in Idaho in 1951 (Philadelphia Electric Company, n.d.). While the development of the atom bomb surely warrants inclusion in the history of US atomic research, it does not feature. A national narrative is of benefit because it provides the opportunity to create a national pride in the technology, assuring support for the continued development of nuclear technology. However, the exclusion of an international narrative, including aspects like the supply chain for uranium is needed to facilitate this. Placing nuclear technology within the bounds of patriotism and progress facilitates a sense of unity and pride, which people can support.

More importantly, the guidebooks move on to develop a local narrative, related to each individual power station and its respective environment. McMullan (2021, 24-5) identified a hierarchy of communication from the industry between 1975 and 1990, which placed decision-makers at the top, followed by journalists and public figures who could influence decision, with the general public at the bottom. However, McMullan (2021, ii, 199) noted that the opinion of the general public who lived near nuclear sites was considered of greater importance than those who did not. The industry was aware of the need for the continued support of the local community, which appears to be represented in these earlier communications through the guidebooks. The contents of each guidebook follow the same format; in many instances the wording and diagrams are identical. However, each nuclear power station had its own guidebook, often multiple versions. A photograph or drawing of that station is featured on the front cover, the importance of the local landscape and its wildlife population is emphasised, and a large local city is identified to offer an example of the relative output of the station. The context is made local, the impact made personal. By focusing on an individual station, the guidebooks can demonstrate a connection of care between the power station and their community, almost offering them to be claimed as a point of local innovation and pride.

Both McMullan (2021, 12) and Kasperski (2019, 52, 55) explore the idea of the 'domestication' of civil nuclear led by the industry to navigate public fears and distrust, in part associated with nuclear weapons, through making connections with mundane aspects of everyday life. The attention drawn to the healthy population of Brent geese brings the discussion of nuclear power back to one of the preexisting concerns for the area, showing that although the power station is operational, local concerns remain mundane. The phrasing 'more Brent geese than ever are visiting Bradwell' suggests that if anything, the power station has participated and assisted in these local discussions, knitting itself into the fabric of the area. The guidebooks offer the electricity industry the opportunity to sketch their story, balancing the novelty and innovation of nuclear technology alongside the mundane aspects of rural life. Emphasis on the mundane draws on aspects which are known, trusted and valued, repeatedly reinforcing a narrative of familiarity and care. Aspects of the exceptional are approached only in the context of celebrating innovation and design to support feelings of pride. The affective impact acts to encourage feelings of safety and pride with aims to win public support for continued development of the nuclear programme through the articulation that nuclear technology is both necessary and harmless. The provision of reassurance and information would serve to ensure that emotional responses to nuclear energy would remain, if not positive, then neutral to reduce opposition to the newly constructed plants and facilitate the expansion of nuclear energy and other nuclear research.

5 Conclusion

This paper offers a look into the methods and materials used to publicise the very first nuclear power stations as examples of the latest technological innovation, which offers a case study examination of a formative portrayal of nuclear energy to the public. Unsurprisingly, the depiction of nuclear energy was overwhelmingly positive and rationalized. Threading throughout is a narrative of omission, of oversimplification, and mediation. The guidebooks offer a representation of the messaging from the nuclear electricity industry during this time, used to support their agenda and ensure continued public support. Published at a formative point in developing public opinion, the selective display of information can be seen as curating a narrative to mediate public opinion. Emphasis on the mundane aspects of nuclear energy aimed to neutralise the nuclear specific aspects by mitigating ideas of risk and disruption.

A rationale for nuclear energy is framed within traditionally-fuelled power stations, drawing inherent connections to an established and trusted industry. Radiation is downplayed as a banal side-effect of producing nuclear energy, discussed only in relation to design, in which both the efficiency of technology and safety were mentioned as adjacent. The omission of discussion of risk banalizes nuclear technology, removing discussion of the clearly nuclear aspects, here highlighting how discussion of nuclear aspects is managed in a subjective manner. Similarly, regular inclusions regarding the protection of nature position the industry as careful custodians of the land, responsive to the concerns of the public, as evidenced by their care for wildlife and aesthetics. Reference to nature leans into an appreciated, understood, and domestic normality, with the continued habitation of bird and plant life acting as reassurance for their health, but also for the safety for humans. The success of wildlife inherently draws parallel conclusions without requiring discussion of radiation and risk to human health.

While the national narrative is targeted at the general public, the local narrative is directed towards the respective local communities. The hope that local communities would adopt nuclear power generation into their economic, industrial and community landscapes would enable the industry greater freedom and opportunity to operate and develop their nuclear sites smoothly. As seen today in the discussion surrounding new nuclear power sites and a geological disposal facility, locations with an existing relationship with the nuclear industry are far more welcoming of further nuclear development. In these areas, the industry has integrated and become a part of local identity. The guidebooks are representative of a period when little was known or understood about nuclear energy by the general public. Aspects of the mundane were emphasised to build on the familiar, highlight the ongoing research, and provide reassurance. The conversation surrounding nuclear energy has shifted; nuclear energy production is now part of the education curriculum and regularly discussed in the media. From being a cutting-edge, mysterious, technology focus is now placed on new nuclear energy projects, and the research and development surrounding the decommissioning of older nuclear sites.

Competing interests

The author declares that they have no conflict of interest.

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