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TURF IN ELECTRICITY GENERATION 1945-2000

WYKORZYSTANIE TORFU DO WYTWARZANIA ENERGII ELEKTRYCZNEJ W LATACH 1945-2000

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Abstract: This paper examines the industrial harvesting of turf and its use in electricity generation in Ireland from 1945 to 2000. It explores the commercial exploitation of Irish bogs which had been neglected for centuries. Exploitation achieved impetus when some revolutionaries such as Todd Andrews advocated economic self-sufficiency. With Government approval, Bord na Móna was created in 1945. Another state body, the Electricity Supply Board (ESB), established turf-fired power plant. These developments had a significant economic impact until the mid 1980s. Thereafter, a combination of ageing plant, and supra-national environmental regulation led to the closure of power stations and the cessation of peat harvesting.

Keywords: electricity, peat, employment, technology, pollution, carbon, climate

Streszczenie: W artykule omówiono przemysłowe zbiory torfu i jego wykorzystanie do wytwarzania energii elektrycznej w Irlandii w latach 1945–2000, oraz komercyjną eksploatację irlandzkich torfowisk, które były zaniedbywane przez wieki. Wzrost nabrał rozpędu, gdy niektórzy rewolucjoniści, tacy jak Todd Andrews, opowiadali się za samowystarczalnością gospodarczą. Za zgodą rządu w 1945 r. utworzono organ państwowy Bord na Móna. Inny organ państwowy Zarząd Zasilania Elektrycznego (ESB) utworzył elektrownię opalaną torfem. Zmiany te miały znaczący wpływ gospodarczy aż do połowy 1980 roku. Następnie połączenie starzenia się instalacji i ponadnarodowych przepisów środowiskowych doprowadziło do zamknięcia elektrowni i zaprzestania zbioru torfu.

Słowa kluczowe: prąd, torf, zatrudnienie, technologia, węgiel, klimat

Introduction

On the face of it, utilising peat, a native fuel in Ireland (gelatinous, black squishy material that must be dug up and left to dry), to generate electricity, seemed to be an inspired idea. It involved the exploitation of peat bogs which covered large swathes of the Irish midlands and part of the West, areas which had lacked productive value for centuries. Such a proposed development would cater for a growing demand for electricity, for a country, that in the 1930s was slowly urbanising, and industrialising modestly. A further incentive to exploit native resources lay in the reduction of balance of payments, through reduced imports of fuels like coal of which Ireland lacked substantial reserves.

In short, this industrial exploitation of native Irish peat, seemed likely to address several problems in a developing economy (McDowell, 1984, p. xx).

This paper will examine the reasons behind the success and ultimate policy reversal of Ireland's use of peat for electricity generation. It comprises five sections.

Firstly, it will examine the background; what in effect to do with resources that had been 'productively' idle for centuries. Secondly, the paper will focus on the setting up of the Turf Development Board, which set in motion the commercial production of peat for industrial use. The third section in turn focuses on the successes and failures of this venture in electrification. Finally, the paper examines the turning of the tide, where good became bad, and the continued use of peat in electricity production became unsustainable in the face of mounting environmental damage and global climate change. Politics plays a significant part in this story and the politics of peat is interwoven into the economic and scientific dimensions of peat generation.

The paper draws on archive material from the the Electricity Supply Board (ESB) and Bord na Mona archives, personal reminiscences (the author worked in ESB in the midlands for a number of years), newspaper articles and selected secondary sources to illustrate the industrial history behind the success and ultimate failure of peat harvesting (Andrews, 2008, pp 211-30).

Background: What to Do with Idle Resources?

Turf or peat bogs have existed in the Irish landscape for centuries, resulting in large tracts of featureless landscape, stretching through the plains of the Bog of Allen in the midlands. Technically bog may be described as "an area covered with *peat*, a biogenic deposit, which is formed under waterlogged conditions when organic matter is produced by plants and deposited at a faster rate than it is decomposed" (Feehan & O'Donovan, 1996, p. 153).

The poet Seamus Heaney has a pithy summary in *Bogland*:

...our unfenced country
Is bog that keeps crusting
Between the sights of the sun... (Heaney, 1969).

This unfenced country had been a conundrum for long, but in the early twentieth century, Sir John Purser Griffith (1848-1938), a renowned scientist and administrator gave the matter serious study, as chairman of a Commission of Enquiry in 1917, which recommended the exploitation of peat for commercial purposes. The committee's recommendations however were not implemented. He set up a miniature factory to harvest and dry the fuel to determine its suitability (hand won turf had been and is today harvested by individuals as a fuel for domestic use). While the experiments did not mature to a marketable product, a start had been made. In time Griffith's reputation meant that even revolutionary figures of the War of Independence (1919-1921) returned to his experiments and used them as inspiration for a policy of self-sufficiency, a policy which gained momentum when Fianna Fáil, a more nationalistic party (formed out of the defeated elements of the opponents of the Anglo-Irish Treaty of 1921), came to power in 1932. These revolutionaries, though conservative in economic thinking, had under the Cumann na nGaedhal government, set up the 'Shannon Scheme' in 1927 pushing through a major project (cost £5m in 1927) that harnessed the Shannon (Ireland's largest river), for hydroelectricity, at Ardnacrusha in County Clare. This hydro station had a capacity of 90 megawatts, which was regarded as too great for the country's needs at that time. Yet, within a few years, further power stations were built to cater for the additional demand, that sprung up in the wake of increasing urbanisation and the Mercantilist policies of the Fianna Fáil government that came to power in 1932. Part of the Fianna Fáil strategy involved 'state entrepreneurs' such as Todd Andrews¹, who taken part in the War of

¹ C.S. Andrews (1901-1985), Irish revolutionary, civil servant, entrepreneur became managing director of the Turf Development Board in 1934, which later evolved into Bord na Móna (*Dictionary of Irish Biography*).

Independence, advocating and making the State a player in the industrialisation drive. Andrews revisited the work, both theoretical and empirical of Purser-Griffith, and became convinced that Ireland's vast bogs contained potential reserves of fuel to power homes and industry for decades to come.

In *'Man of No Property'* (Andrews, 2008), Andrews recalls that he had begun to move on from military activity to economic patriotism, by trying to promote state involvement in the creation of native industry, on a massive scale if necessary. This was a form of state socialism, even though in the Ireland of 1930s calling it such have led to associations with Communism, then a taboo doctrine. Such state enterprise, in fuel exploitation, had the capacity to increase employment, reduce imports, and thus help Ireland's balance of payments – an important issue for a newly independent state. Further benefits of such enterprise were the creation or rejuvenation of communities in the midlands that had been hidden due to remoteness, and isolation; and additionally, the excavation of 'brown gold', the equivalent of coal in other countries, but without the dangers involved in excavating it.

Once the Turf Development Board was set up, issues of technology and politics began to impinge on the visionary status that the project had had heretofore. The key objective was capitalisation – finance to enable the Board to operate as a business; this was now under the remit of the Department of Transport and ultimately the Department of Finance which was an ultra-conservative body. However, Andrews through cajoling and bullying managed to persuade officialdom that an autonomous body, state controlled ultimately but having freedom to operate, would be best suited to the exploitation of the bogs. In 1934, the Turf Development Board was set up. This improved output and the advent of World War Two increased the demand for native fuel and gave the status of turf and added lustre. So much so, that official goodwill increased, and support was forthcoming, both politically and administratively for the setting up of Bord na Móna in 1944. The act which passed into law in 1946 also specified that future electricity production should, from then on, be based on turf (Andrews, 2008, p. 186). The act further specified that two turf-powered stations should be built immediately; Portarlinton and Ferbane (Clarke, 2010, pp. 71-72). This specification relating to electricity production, guaranteed a market for peat production. Essentially two monopolies had been created, one for the generation of electricity and the latest one to produce turf, which in turn had a guaranteed customer, ESB. In today's world of EU single market and global free trade, this arrangement would be seen as a highly monopolistic practice, but in the post-war period, Ireland was merely following a lead set elsewhere in Europe in which nationalisation of the 'commanding heights' of the economy was becoming the norm.

Generating Electricity from Peat: Small Beginnings 1948-1952

The scene was set. Inert Irish bogs lying idle for centuries, had begun to be exploited in the 1930s, had become accepted as a fuel source in the years of World War II. Now, with the passing of the act setting up Bord na Móna in 1946, the construction of the first power station designed to burn peat was about to begin. For Andrews and those favouring the harnessing of native resources, it was a dream come true. However, the Electricity Supply Board and particularly its generation engineers were not among those toasting the future, certainly not a turf future. The economics of peat-fired generation were, as far as ESB managers were concerned, not adding up. Put simply, the cost of the fuel was more expensive than available alternatives. In addition – and this was to be a recurring bone of contention for decades – its quality, specifically its moisture content, was regarded as too high. This was self-evident – turf had to be cut and laid out in open bogs exposed to the elements of rainy Irish Winters and damp Springs

Nevertheless, Government policy, protectionist and patriotic, was something the ESB could not overrule or ignore; after all it was a sister state company, autonomous in how it carried out its business, but subject to Government on questions of types of power stations it should build. The building of a station, small even by the standards of the day, went ahead at Portarlinton in the Irish midlands, and by 1950 it was generating 25 megawatts, or 9.5% of total output. Ironically, there had been a change of government in 1948, and

though the new government was less protectionist, there was full commitment to the peat harvesting and utilisation process, and the new minister for Industry and Commerce, Daniel Morrissey, formally opened the station in 1950 (McCowen & Culleton, 2005, p. 38). Portarlinton station was designed to, and did burn sod peat, which was difficult to harvest, but more efficient as a fuel than milled peat, which would be a feature of later peat generating stations. Sod peat, machine produced, was like ‘hand won’ turf which had been in domestic use across Ireland for centuries. Though the erection and operation of Portarlinton was a landmark, supply and quality difficulties beset its performance during its early operation, so much so that its frequent unavailability for generation needs led to a supply shortfall in 1951 as demand surged. However, a second power station was under construction and came on stream shortly after Portarlinton began operation; by the end of 1952, Allenwood sod peat power station, a short distance from Portarlinton, was generating 36 megawatts of electricity. Ironically, as the bogs of the midlands had begun to produce ‘brown gold’ and create the conditions for modernisation through electricity generation, most of the inhabitants lived by candlelight – rural electrification did not bring material gains to some households for decades to come. See, Lyons in (Nowlan & Williams, 1969), and (Shiel, 1984).

Sod peat fired power stations at this stage accounted for 14% of generation (Clarke, 2010, p. 79). While teething problems (machinery, labour shortages, wet peat) were a feature, 1952 figures show total employment by Bord na Móna at 6,100, a considerable figure in 1950s Ireland which had a small and declining population:

Table 1. Total Population and Inter-censal Change, 1956-2016

Census Year	Population	Change	%
Year: 1956	2,898,264	-62,329	-2.1
Year: 1961	2,818,341	-79,923	-2.8
Year: 1966	2,884,002	65,661	2.3
Year: 1971	2,978,248	94,246	3.3
Year: 1979	3,368,217	389,969	13.1
Year: 1981	3,443,405	75,188	2.2
Year: 1986	3,540,643	97,238	2.8
Year: 1991	3,524,719	-14,924	-0.4
Year: 1996	3,626,087	100,368	2.8
Year: 2002	3,917,203	291,116	8.0
Year: 2006	4,239,848	322,645	8.2
Year: 2011	4,588,252	348,404	8.2
Year: 2016	4,761,865	173,613	3.8

Source: Central Statistics Office (2016)

The Move to Milled Peat: 1955 Onwards

A critical issue now arose – could and should milled peat be used to generate electricity? Some doubts were expressed on the ESB side; engineers suggested that the fuel would be wetter, less efficient, and necessitate the use of new machinery to burn the fuel, in comparison with sod peat, which was now assuming a status of tried and tested technology. As ever, technology and economics bowed to politics. While a change of government in 1948 led to Fine Gael ministers (Fianna Fáil’s arch-rivals) assuming responsibility for the direction of fuel policy, and thus some stalling on the issue, it was a situation, a *fait accompli* really, that left even partisan players with no option but to proceed. The return of Seán Lemass to the ministry when Fianna

Fáil returned to government in 1951 accelerated the process: in effect he told ESB, build power stations to burn turf of both varieties, milled and sod peat. Shortly afterwards, the government decided that all future peat-burning stations would be milled peat (Clarke, 2010, p. 111).

Building work started on a power station at Lumcloon in the western midlands (to be called Ferbane power station, after the nearest town) and this was completed by 1957. This was to be the first of many milled-peat stations. However, their progress was interrupted by an economic downturn in Ireland in the mid 1950s. Irish economic policy was beginning to run aground at this stage. As Europe, including the United Kingdom, was recovering from the devastation of World War II, helped by the Marshall Plan and the creation of the European Coal and Steel Community in 1954, Ireland, neutral during the war, was becoming more isolated both politically and economically. The policy of protectionism, in which the burning of turf for electricity was a prominent feature, was proving counterproductive; the expansion of the British economy due to massive rebuilding programmes after the war, pulled hundreds of thousands of young Irish people to London and major British cities such as Birmingham, Coventry, Manchester. This led to a double effect in Ireland: reduced economic demand because of a declining population, and reduced energy and enthusiasm which youth could provide (Lee, 1989; Bielenberg & Ryan, 2012). Ireland was becoming a country for old people; in this situation immediate needs for more electricity were reducing and ESB's reluctance to commit to more stations in the mid 1950s made economic sense. However, yet again, international developments changed the debate and the economics of peat burning electricity stations changed dramatically. In 1956, the Suez crisis erupted when President Nasser of Egypt seized control of the Suez Canal. Britain, France and Israel intervened in a (successful military) operation to confront Nasser but were dissuaded from further actions by US President Eisenhower. Uncertainty over oil supplies caused supply to contract and prices to rise steeply on international markets. As a result, peat-burning electricity stations were suddenly economically viable, and were it not for them, rationing of electricity would have taken place in 1956.

With the backing of Lemass, the turf board Bord na Móna was in a strong position and all it had to do was develop virgin bog and produce peat, now milled. Furthermore, erstwhile revolutionary Andrews had overseen significant technical strides in the fledgling organisation. Experience of bog development and operation had encouraged innovation and engineering excellence. Andrews was able to strike a self-congratulatory note when Bord na Móna managers visited Moscow in 1956 to inspect peat bogs managed by the USSR. He felt that the Irish delegation had some expertise to impart rather than absorb, which had been the case on a previous visit in the 1930s. The scale of the Soviet operation was of course much greater than their Irish equivalents, and in addition to peat burning electricity stations, the Soviets also utilised the raw material of the bogs for gas manufacture (Andrews, 2008).

While the official ESB position was bureaucratic and obstructionist regarding expansion of peat production, on the ground there was an acceptance of the reality of peat-burning plants and a commitment to make them work and an acknowledgement of satisfactory operation (Kelly & Coakley, 1960, p.1). Others, such as Robert Magee, a manager at Portarlinton plant, have pointed out that "a low grade fuel does not mean a poor fuel, it simply means that the design of the plant and techniques of burning have to be adapted to meet this type of fuel" (Mullins, 1993, p.iv). Frank Burke an engineer at Ferbane recalled a time of cutting edge technology to convert milled peat to electricity Further plant was commissioned and installed at a few locations in the Irish midlands including Rhode and Shannonbridge in County Offaly, Lanesboro in County Longford. In all proximity to the producing bog was a determining factor in the location of the plant. As Manning and McDowell summarise, by the end of the 1960s almost one third of ESB generating capacity was made up of peat-burning plant, and although there was an element of distorted economics at work, milled peat proved to be a cheaper and a more efficient fuel than sod peat (Manning & McDowell, 1984, p. 120). During the 1960s and into the 1970s these milled peat stations increased capacity and, it is fair to say, the vision of Purser Griffith, of Purcell, and of Andrews had borne ample fruit. Bogs which had been idle for centuries, had within the course of two decades become productive in manufacturing and selling turf as

a domestic fuel, and in selling the surplus for electricity generation. In effect it was electricity generation that made the difference. Bord na Móna by the 1960s and into the 1970s was, as previously mentioned, supplying fuel for electricity generation and the turf plant was a significant component of ESB's overall generation output. Furthermore, these developments transformed the Irish midlands from remote backwaters to thriving communities that hosted large workforces of two state companies. The accompanying table gives an indication of the impact on employment in the Irish midlands of the manufacture of turf and its use in power generation.

Table 2. Peak Employment (Bord na Móna) 1958-1972

Year (Summer)	Peak Numbers
Year: 1958	5780
Year: 1959	6960
Year: 1960	6560
Year: 1961	7460
Year: 1962	6040
Year: 1963	5960
Year: 1964	6370
Year: 1965	6160
Year: 1966	6790
Year: 2067	6180
Year: 2068	6020
Year: 2069	5640
Year: 2070	5440
Year: 2071	5540
Year: 2072	5410

Source: Clarke, 2010, p. 169

While the figures seem impressive, it should be remembered that employment with Bord na Mona was seasonal, and had to be supplemented with welfare supports over the Winter period. Politicians such as William Norton, while fully supportive of the concept of State enterprise in turf harvesting lamented the fact that “work with Bord na Móna starts at various times from February onwards and continues until October. It may be a little later, but normally work tapers off in September and October” (Norton, 3/3/1959). It should also be noted that peat harvesting (and indeed its generation for electricity), was an almost exclusively male occupation.

The Tide Turns: 1980s onwards

On 15th January 2021, Bord na Móna, the Irish turf producer issued a press release headlined: “Bord na Móna announce formal end to all peat harvesting on its lands”(Bord na Móna, 2021). This remarkable press release of a mere five hundred words or so, went on to confirm that “peat harvesting has been wound down and stopped” (Bord na Móna, 2021). It further stated that its business in the future (as it had been in the recent past), would be in climate solutions. This could be summarised as: past exploitation of bogs, of which we were a world leader, bad; current and future preservation of bogs, good.

In the previous section, we witnessed the high tide of peat harvesting, both for sales to the general public and as a raw material for electricity generation This peak occurred in the late 1960s when turf accounted for nearly 35% of total electricity generation in 1967 (ESB, 1967). However, by 1978 this figure had dropped

to 24% (ESB, 1969, 1975, 1978). The reasons for this were twofold: firstly, other fuels such as oil continued to grow in the ESB portfolio, thereby diminishing the overall share by turf; secondly as generation matured in the 1970s (fifty years after the founding of ESB) fuel diversity became an imperative. ESB began to look at other sources including natural gas (reserves had been discovered off the Southern coast in the early 1970s), and controversially nuclear power (Manning & McDowell, 1984, p. 122). Thus, peat-fired generating stations began to slip in importance as a fuel source and as plant aged, it became less reliable and subject volatility. While additional plant was installed in the late 1970s, the share of capacity did not increase. What contributed ultimately to the demise of peat as a harvested fuel was hardly apparent initially, but in time became the main reason for its decline. This is apparent if we see the progress of an organisation like the Irish Peatlands Conservation Council from a tiny lobby group, to one which played an important part in the overturning of peat harvesting. It has transformed from a group of young environmentalists to an organisation that formed a pillar of the Irish Social Partnership in the early 2000s and owns a number of bogs, both purchased and donated, which it works to preserve and protect (Irish Peatlands Conservation Council, 2022). This period, roughly from the late 1980s on, has seen a global climate crisis emerge, driven in large part by the intensification in the use of fossil fuels, particularly, but not exclusively in electricity generation. Such fuels include coal, oil, gas, shale, and of course turf.

It could be argued, and indeed it was argued, that pollution from Irish peat stations represented a tiny fraction of global emissions. The Irish argument initially, at corporate and governmental level was that all Irish emissions were insignificant and had little spillover effect on neighbouring countries. However, this argument contradicted both the spirit and the letter of European co-operation as exemplified by the creation of the EEC and subsequently the EU. A key component of EU environmental policy as set out in numerous treaties is that “the polluter should pay” (Nugent, 2017, p. 366), recognising that countries cannot gratuitously burn fossil fuels without regard to their neighbours particularly and the planet in general. Gradually, through a combination of EU directives, licencing obligations, public opinion and political pressure both the turf harvesting and electricity production came under sustained attack. In the case of turf harvesting the scientific evidence began to accumulate and the message was stark: industrial exploitation of bogs was destroying bog environment and ecosystems. Virgin bog acts as a carbon sink, helping to reduce the detrimental effect of greenhouse gasses. The second aspect of this vicious circle was the production of the greenhouse gases – from the burning of fossil fuels (which includes peat) for electricity. Put simply, Bord na Móna was destroying an asset that protected the environment, and the ESB was creating greenhouse gas emissions by burning fossil fuels from the peat which Bord na Móna was supplying. Matters were further exacerbated through less efficient and more polluting older plant. Step by step, peat burning stations began to close; as the closures occurred, the exploitation of the bogs made no economic sense. By the early 2000s all peat burning stations had closed and shortly afterwards all were demolished, leaving no trace of previous footprints behind

Conclusion

This paper has examined the ‘rise and fall’ of bog exploitation in Ireland in its economic social, and political dimensions. Bogs had lain idle for centuries and thanks to the efforts of visionaries and technical pioneers in the 1930s and 40s, innovative ways and means were found to harvest peat on an industrial scale and to make it available for electricity generation. This combination of peat harvesting and its utilisation for electricity enabled Ireland to be partially self-sufficient at times of crisis (wars, shortages of oil, global price surges). In addition, it stimulated economic activity in the Irish midlands, creating significant employment for decades, direct employment in the state sector (a form of state socialism), and downstream in the private sector as retail and small manufacturing availed of opportunities to support harvesting and generation. As the twentieth century ended however, the ravages wrought on the environment by global economic expansion led to regulatory pushback at national and supra-national level. What was good became bad: peat production

in vast bogs was by the early twenty first century akin to the 'dark satanic mills' of industrial England of the nineteenth century. Attempts to keep bogs and associated electricity plant going were doomed and one-by-one, harvesting bogs and power plants closed. Allowing bogs to act as a carbon sink now became government and EU policy. However, like post-industrial communities across Europe, efforts to maintain employment in what were once thriving communities, had become a highly contentious political and social issue which remains unresolved.

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