Chapter 25
Engineering and Re-engineering Earth: Industrialized Harvesting of Ireland's Peatlands and its Aftermath[1]

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25.1 Introduction

Such has been the transformation of the planet Earth by human activity over the last 200 years that Wood (2009), quoting scientist Paul Crutzen, has suggested that geologists should henceforth refer to these two centuries as the "anthropocene" period. In that time, according to Wood, humans have reshaped about half of the Earth's surface. While some of this reshaping has been unintended, for the most part it has constituted deliberate engineering, that is, the application of science, technology and know-how to achieve particular ends. The result has been the transformation of the earth, identified by Kates (1987) as one of the key strands of the analysis of human/environment relations, and one of the core concerns of geography as an academic discipline.

"Earth" being a concept with many meanings, here we use it to refer to the surface of our planet, which provides the environment for human habitation, and that thin layer of earth's crust underneath the surface from which humans derive most of the resources which sustain their civilization. The term "earth engineering," therefore, describes both the restructuring of the earth and the extraction of its resources in order to facilitate human occupation and subsistence. While much of the earth engineering which has occurred to date consists of small and localized incremental alterations, as human technology has advanced so has the scale of earth-engineering interventions, leading to a rising frequency in the incidence of the megaengineering projects which are the focus of the current volume.

This chapter focuses on one such project, that is, the large scale mechanized harvesting of peat from Irish bogs, a project which has been ongoing for more than seven decades and is likely to continue for at least two more. In its areal impact, this project represents the most extensive episode of planned earth engineering in Ireland since the transformation of the island's agricultural landscape associated with the

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commercialization of farming in the 17th and 18th centuries (Aalen, Whelan, & Stout, 1997). This is a fascinating story in terms of the development and utilization of appropriate technologies, the extent of landscape transformation involved, and the social and economic impacts of this transformation on the areas affected.

The remainder of the chapter outlines the physical/environmental and historical background to the launching of the peat harvesting project in the 1930s, provides a descriptive account of the development of mechanized peat harvesting and processing, and analyzes the socioeconomic impact of this development in the areas affected. It concludes with an assessment of the likely uses to which the residual peatlands will be put following the cessation of peat extraction, representing a second exercise in earth engineering which, in terms of the complex issues involved, may prove to be even more challenging than the first.

25.2 The Physical Resource: Ireland's Peatlands

Peat develops from the accumulation of dead vegetation that fails to fully decompose due to the anaerobic conditions brought about by constant soil waterlogging. Such conditions can arise either in areas of high constant precipitation or on the margins of water bodies such as lakes. High levels of rainfall in Ireland's upland areas and along the western seaboard create pervasive conditions for peat formation, resulting in the creation of so-called "blanket bogs" (Fig. 25.1) which cover the landscape over extensive areas (Feehan & O'Donovan, 1996). Such bogs are to be found over 7% of Ireland's land area. Blanket bogs are typically 2–3 m (6.5–9.8 ft) in depth, but deeper localized pockets provide accumulations of peat suitable for extraction for fuel. Manual harvesting of such pockets has been an important fuel source for local households for several centuries.

Extensive peatland development also occurred in Ireland's central lowlands from the gradual in-filling of lakes which were a widespread consequence of the deposition of glacial material during the most recent episode of glaciation which concluded some 10,000 years ago. A particular feature of such bogs is the tendency, once the original lakes have been completely in-filled by vegetation, for further layers of sphagnum moss to accumulate on the surface which thereby becomes raised up relative to the surrounding countryside. The resulting so-called "raised" bogs (Fig. 25.1), which also cover some 7% of Ireland's land area, have a typical depth of between 6–7 m (19.7–22 ft) usually divided between a bottom layer of reed-based peat, a middle layer of woody peat derived mainly from trees, and an upper layer of moss peat.

25.3 Origins of Mechanized Peat Harvesting

Harvesting of peat has been a routine feature of the domestic economy of rural households for many centuries in those areas with access to suitable nearby bogs. However, utilization of peatlands increased enormously with the rapid growth of

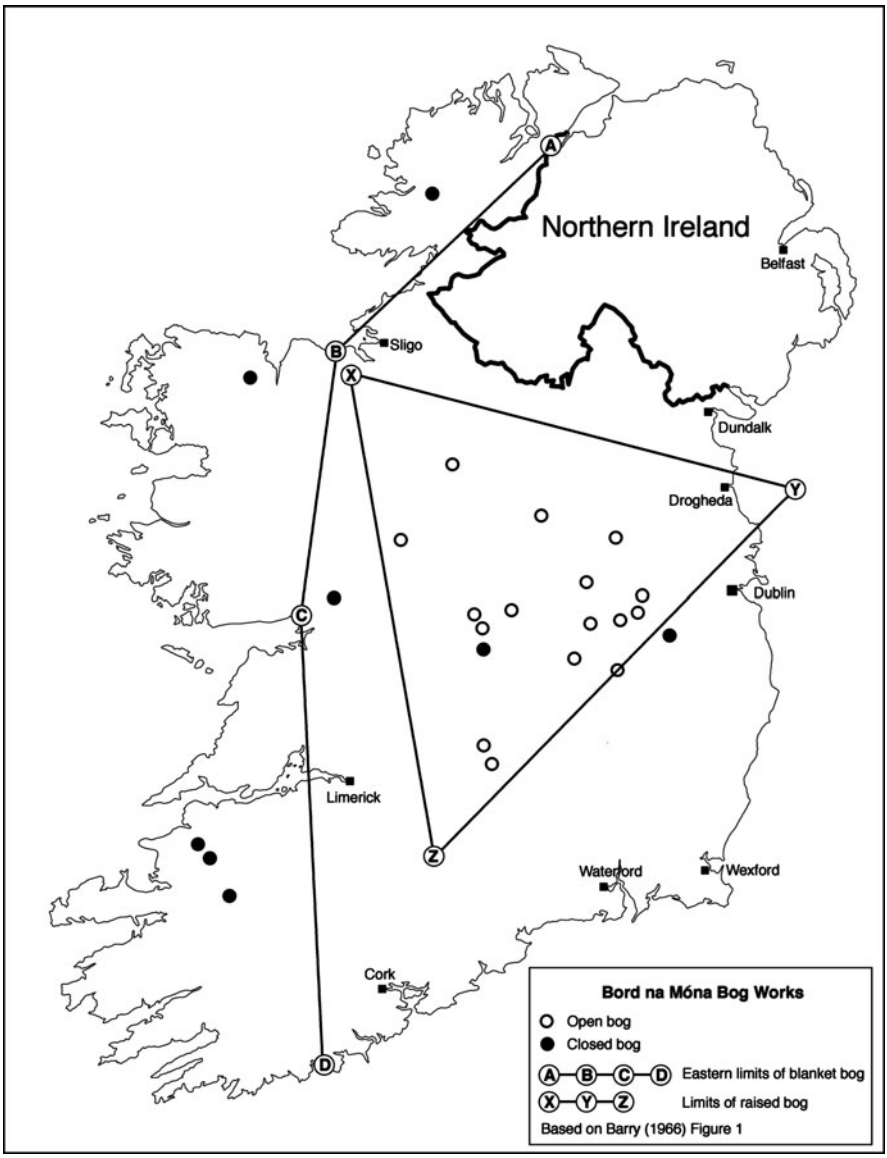

Fig. 25.1 Peatland regions and Bord na Móna bog works

the rural population in the early 19th century, leading to widespread colonization of marginal land by landless families. While this pressure was subsequently relieved by the effects of famine and emigration, today it is reckoned that almost one-half of the original total area of virgin peatland has been lost or significantly disturbed through domestic harvesting down through the centuries (Renou-Wilson, 2009).

Despite this extensity of impact, by the turn of the 20th century the great bulk of the potential fuel resource which Ireland's peatlands represented remained untouched, due principally to the sheer size of the resource and the difficulty of gaining access to the largest and deepest bogs where the bulk of the resource was locked up. Grandiose schemes for tapping this resource had been proposed from time to time, and in the early 20th century some experimental work on developing mechanized methods of bog drainage and peat harvesting were carried out. However, the first steps towards fostering large scale development of Ireland's peatlands was taken by the Fianna Fáil government which had been elected in 1932 (ten years after the establishment of what was to become the Republic of Ireland) on a platform of making the state as economically self-sufficient as possible. In 1934 the Turf Development Board (TDB), a state-owned company with a remit of progressing peat harvesting, was established by the new government.

The following year a TDB delegation embarked on a fact-finding tour of mechanized peat harvesting works in Germany and the Soviet Union, following which it was decided to pursue large scale harvesting by the TDB itself for the purpose of feeding electricity generating stations which would be built alongside the bogs. In order to facilitate this objective, the TDB was given compulsory purchase powers to acquire suitable tracts of peatland. The first such acquisitions were made in 1936 and were subsequently brought into production using a combination of machinery developed by the TDB itself and imported from Germany. In 1939 the TDB purchased a privately-owned factory in County Kildare which made molded briquettes, suitable for home consumption, from compacted peat.

The trajectory of the Board's subsequent evolution was profoundly affected by the outbreak, in 1939, of the Second World War, which ruled out further imports of equipment but which, at the same time, had the effect of transforming public perceptions of the value of Ireland's peatlands. As a non-participant in the war with virtually no native reserves of coal, Ireland faced a major problem of energy supply, and the government sought to at least partially fill this gap through launching a major national campaign to expand peat production. While most of this effort took the form of small-scale local efforts, it also included an ambitious venture on the part of the Turf Development Board which sought to bring 10,000 hectares (25,000 acres) of peatland into production in northwest County Kildare, just west of Dublin. Relying on manual harvesting, this project required the recruitment of 4,000 migrant workers who were housed in 14 residential camps distributed throughout the area. The project went into full production in 1943 and yielded some 600,000 tons of peat before it was closed down in 1947.

25.4 The Establishment of Bord na Móna

The growing prestige of the Turf Development Board was recognized in 1946 when, following the submission to the government of an ambitious plan to further expand the development of the peatlands, the Board was reconstituted as Bord na Móna ("The Peat Board"), a commercial state company with a stronger statutory basis and

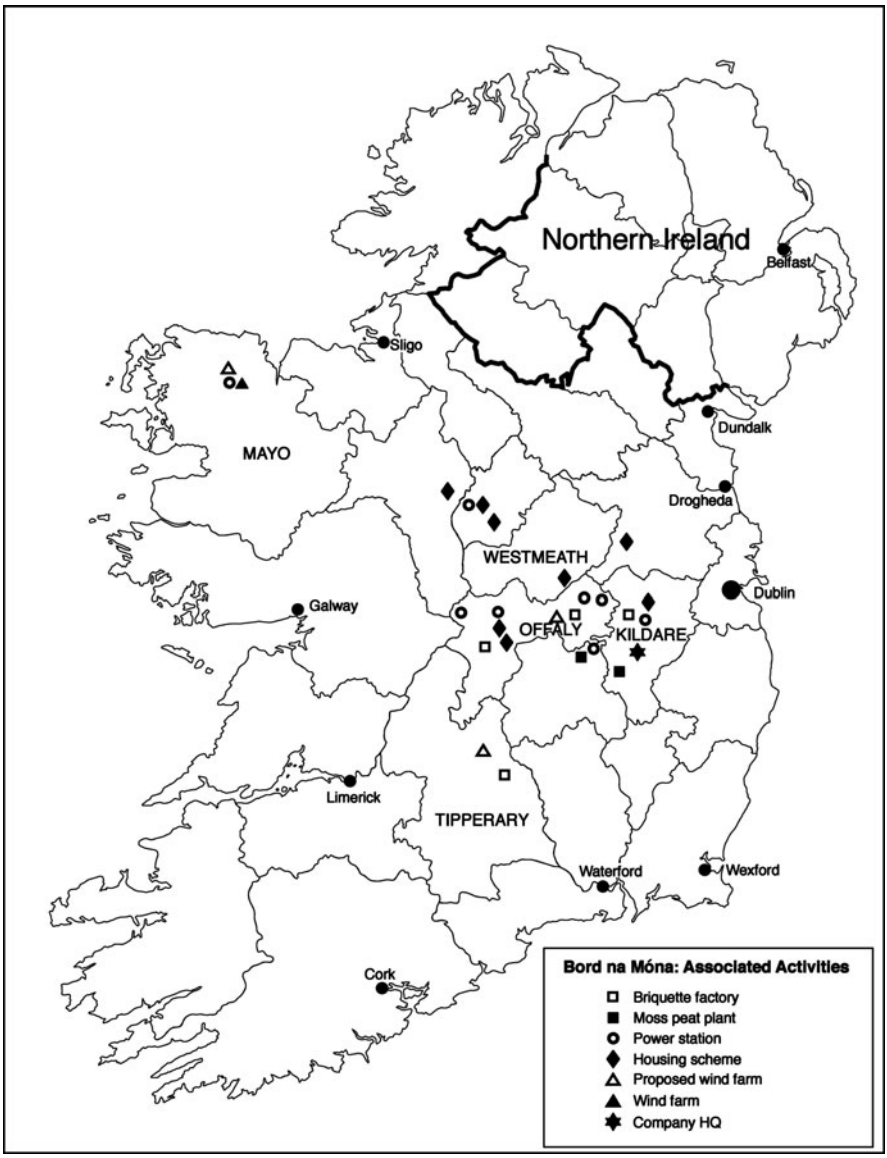

Fig. 25.2 Activities associated with the development of Bord na Móna peatlands

more clearly defined mandate than the TDB. Bord na Móna immediately embarked on a major development program which involved bringing into production 21 new bogs in nine of the Republic of Ireland's 26 counties as well as expanding the output from the company's existing bogs in order to raise annual production from 150,000 tons in 1946 to one million tons by 1950. Production of briquettes was expanded and a plant to process moss peat for horticultural use established (Fig. 25.2).

25.5 Workers' Hostels

A key feature of the early development of peat production by both the Turf Development Board and Bord na Móna was the extensive utilization of hostels to accommodate the large numbers of mainly seasonal workers required for this work (peat harvesting being confined to a summer weather window extending from mid-April to mid-September). The need to construct these hostels reflected the low population density in the peatland areas and hence the absence of alternative accommodation options. These hostels had the appearance of military encampments, with rows of accommodation units interspersed with communal washing, catering and recreational facilities (Fig. 25.3). The Turf Development Board had begun constructing these before the war, but their deployment was greatly accelerated by the initiation of the wartime peatland development project in County Kildare, which involved the rapid recruitment of some 4,000 migrant workers. By 1945, 80% of the Board's total workforce of 5,100 was resident in hostels, giving an average head-count per hostel of some 300.

The TDB was faced with a steep learning curve in dealing with the logistical, catering, sanitary, health, moral, social and recreational needs of an entirely male labor force assembled virtually overnight, but one with which it appears to have come to terms admirably. A sample of the records of 210 residents in hostels in the East Midlands in the period 1944–1956 found that they were mostly unmarried and in their late twenties and were sourced from all over Ireland, divided equally

Fig. 25.3 1940s hostel for temporary bog workers (Source: Bord na Móna)

between rural and urban areas (Curry, 1987). While the combination of this demographic profile and the hostels' spartan living conditions could have occasioned an element of social tension, there is no evidence of this having been a significant problem. The long (48 h) and arduous working week and the good summer weather undoubtedly helped in this respect, while morale was also boosted by the organization of sporting competitions of various kinds between the hostels and considerable investment in other forms of recreational activity.

The ending of the war and the subsequent opening up of alternative fuel sources led to a scaling back of peat harvesting and a substantial reduction in the numbers of workers accommodated in hostels, from 4200 in 1945 to 2800 in 1947. Bord na Móna continued to establish hostels to serve newly-developed bogs up to 1956, but gradually their use was wound down. This can partly be attributed to the increasing use of local farmers for seasonal summer work, but mainly to changes in Bord na Móna's mode of operation which required a much higher proportion of permanent, year-round, workers for whom hostel accommodation was not an acceptable option.

25.6 The Development of Mechanized Harvesting

The late 1940s saw Bord na Móna implementing the mechanization program initially planned prior to the outbreak of the Second World War. In line with the linear nature of much technological innovation, this program initially focused on developing mechanized methods for producing sod peat, similar in form to that traditionally produced by manual means, although different in constitution, as the peat was first macerated (i.e. intermixed) in order to create a uniform quality before being extruded by the harvesting machinery.

While sod peat remained the dominant form of peat extraction until 1959, over time Bord na Móna moved gradually to an alternative extraction method involving the harvesting of milled peat. In this method, tractor-drawn rotating drums fitted with pins strip a thin (1.5 cm or 0.6 in) layer of peat in the form of a fibrous powder from the bog floor (Fig. 25.4). This is then gathered into long ridges alongside which narrow-gauge railways are laid to convey the peat to its end-use destinations (Fig. 25.5). This harvesting method has proved to be much more cost-effective than the sod peat alternative, while also delivering peat in a form which burns more efficiently in electric power stations. The growing demand for peat briquettes as a form of domestic fuel was a secondary reason for expanding milled peat production, which now accounts for almost all Bord na Móna production for fuel purposes.

Because of the long lead-in time involved in the preparation of virgin bogs for production, Bord na Móna's peat output grew quite slowly in its early years, and by 1950 was only two-thirds greater than the 1946 level. However, thereafter output accelerated rapidly, growing ten-fold between 1950 and 1960. This growth was further facilitated by the launching of a second development program in 1950 which aimed to raise output to 4 million tons annually (a target which was eventually reached in 1968) from a 1950 level of just 250,000 tons.

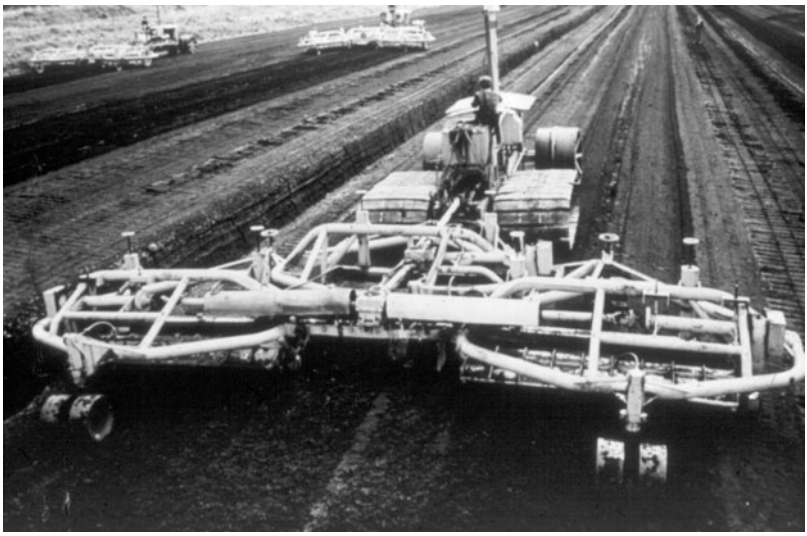

Fig. 25.4 Peat milling machine. Spiked drums strip 1.5 cm (0.6 inches) of peat from bog surface (Source: Bord na Móna)

Fig. 25.5 Peat harvesting. Milled peat is collected in progressively larger piles prior to loading onto trains. (Source: Author)

25.7 The Bord na Móna Housing Schemes

With the expansion of its harvest area and output, and the growing use of mechanized production methods, the nature of Bord na Móna's workforce changed profoundly. There was now a much greater need for more technically-skilled workers to operate and maintain machinery and equipment, including its extensive railway system, eventually reaching over 1,100 km (700 mi) in length (Fig. 25.6). In addition, while in the beginning the company imported most of its equipment, over time it increasingly developed and built its own machines, designed to cope with

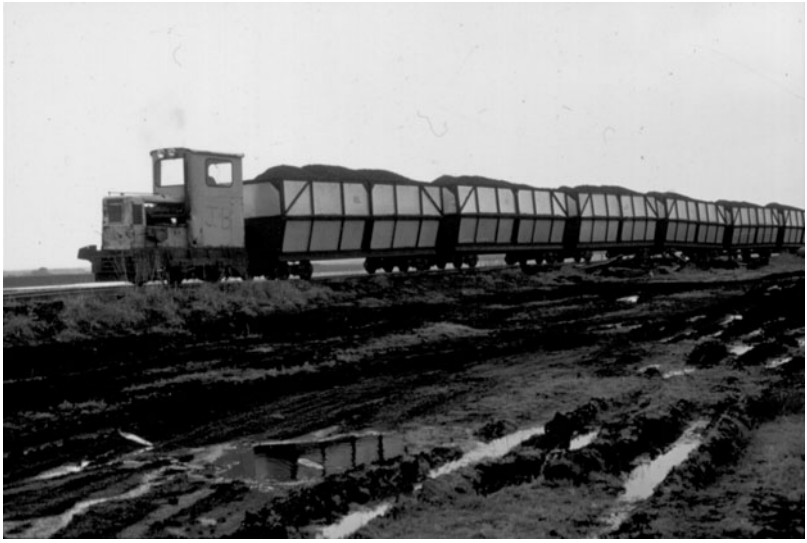

Fig. 25.6 Peat train. Peat trains, running on temporary tracks, transport peat from bogs to power stations or briquette factories (Source: Author)

the distinctive characteristics of Irish peatlands. These innovations added considerably to the company's need for skilled engineering workers. In order to be able to recruit, retain and develop such skilled workers, Bord na Móna would have to hire them on a permanent basis and provide them with superior accommodation than what was available in the hostels. Furthermore, from the beginning, the company adopted a decentralized operational structure, with each of its production centers (of which there were 25 by 1970) having its own managerial, accounting and engineering team. This meant that the demand for good-quality housing was spatially very dispersed.

This housing demand was the background to Bord na Móna's decision to construct, in the early 1950s, eight company-owned housing developments adjoining its peat works; these ranged in size from eight to 156 houses, amounting in total to 574 units. The company policy was to attach the housing developments to existing villages, provided a suitable building site was available which was within 5 km (3 mi) of the main railhead of the relevant bog works. In fact, seven of the eight developments met these criteria, the exception being Coill Dubh in County Kildare, which was constructed in a greenfield site and was (at 156 units) the largest of the eight developments (Fig. 25.7). These houses provided a standard of accommodation that, at the time, was unusual in rural Ireland, with electricity, hot and cold running water, three bedrooms and an indoor toilet. They were built and maintained by Bord na Móna to a high standard, with a distinctive architecture and facing onto communal greens without individual front gardens.

Fig. 25.7 Bord na Móna housing development under construction, early 1950s. Note peat bog in background. (Source: Bord na Móna)

The installation of these housing developments in very remote rural areas had a range of socioeconomic impacts which have been documented by Curry (1987). Whereas local dwellers had become accustomed to the seasonal comings and goings of the temporary hostel denizens, they now had to come to grips with a new corps of permanent residents who, in terms of social and occupational makeup, were almost as exotic and alien as the houses in which they lived. They were outsiders; they were industrial workers in permanent and generally well-paid jobs; they lived in strange looking houses with facilities which few locals enjoyed; and, despite their dispersed origins, they quickly formed into tightly-knit communities.

The new residents clearly brought many benefits to the areas in which they settled. Their spending power was a boon to local providers of commercial services; they added greatly to the viability of public services which tends to be fragile in rural areas; and they represented an infusion of communal energy and social capital into their host communities. At the same time, they also had the effect of upsetting established social arrangements and threatening existing power structures. Some larger farmers resented the development of local bogs by Bord na Móna as it provided alternative employment opportunities for poorly-paid farm workers, while those who controlled local sporting and community organizations also saw their positions as coming under threat. However, for the most part these upsets comprised a single shock to local social systems and, over time, the Bord na Móna houses and their occupants melded into, and generally strengthened, the local communities into which they were implanted.

25.8 Power from Peat

From the outset, the main purpose of Bord na Móna's program of bog development was to provide fuel for electricity generation which, at the time, was the monopoly responsibility of another state-owned company, the Electricity Supply Board (ESB). The first two ESB power stations to use peat supplied by Bord na Móna commenced production in 1950 and 1952 and were designed to burn sod peat. All subsequent peat-fired power stations were designed to consume milled peat, the first being built in 1957, with four more following in the late 1950s and early 1960s. All of these were located in the Midlands raised bog region with the exception of one station serving an extensive tract of upland basin peat in County Mayo in western Ireland (Fig. 25.2). By 1963, peat accounted for 40% of Ireland's total electricity production. Most of the peat-fired power stations, being located away from substantial rivers, required the construction of water cooling towers which became key landmarks in the extremely flat Midlands region (Fig. 25.8).

Fig. 25.8 Rhode peat-fired power station c.1960 (Source: Bord na Móna)

25.9 Local Economic Impacts

Mechanized peat harvesting and associated processing activities had a major economic impact on the districts where these activities were introduced. These districts were characterized by a very heavy dependency on agriculture and, given that farms were generally small and the land was of poor quality, average farm incomes – and, therefore, incomes in general – were relatively low. One can appreciate, therefore, what the introduction of two major industrial employers (Bord na Móna and the

ESB) meant to the areas in question. This impact was particularly significant in the 1950s, for two main reasons. Firstly, while by the end of that decade Bord na Móna's total workforce was much the same as when the company was established in 1946, there had been (as we have seen) a profound change in the nature of that workforce in the interim, in that the seasonal, unskilled and migrant labor which had been the mainstay of the organization in the 1940s, had been replaced by a permanent and resident workforce with higher skill levels and incomes which were much more likely to be spent locally. Even the seasonal workers who still made up one-fifth of the total workforce were now drawn mainly from the local farming community. Furthermore, the construction of peat-fired power stations created a substantial amount of additional highly-skilled jobs.

The second reason why the local economic impact of Bord na Móna and the ESB was particularly significant in the 1950s was because this was a decade of national economic stagnation during which total employment fell by 14% and emigration reached extremely high levels (420,000 net in the decade after 1951 when the total population was just under three millions). In the case of County Offaly, where Bord na Móna had its biggest presence (Fig. 25.2), between 1951 and 1961 employment in peat production and electricity generation grew by 37% to 2,084, which amounted to almost one-fifth of all non-agricultural employment in the county. This greatly helped to stabilize non-agricultural employment, which fell by just 3% over the decade compared with 8% nationally. These figures were reflected in population change, in that Count Offaly's population fell by just 2% compared with figure of 7% for the country at large outside of Dublin, the national capital.

A very significant feature of the employment provided by both Bord na Móna and the ESB was that it was almost entirely male employment (well over 90% in both cases). However, the consequent lack of employment opportunities for women was not a social concern at a time when men were generally much better paid than women and the tradition was that women (at least when married) did not work outside the home, particularly in rural areas. Thus, for the majority of people, the well paid male industrial worker was the ideal anchor around which to build a family unit. As it happened, some spin-off activities from the development of the peatlands did have the effect of generating significant levels of female employment. For example, in 1962, a mushroom-growing enterprise was established in west County Kildare using peat mould sourced from Bord na Móna as its growing medium. By 1987, this enterprise employed 400 people, over half of whom were women (Curry, 1987).

25.10 Evolution of Bord na Móna Activities

While 80% of Bord na Móna's fuel peat production goes to electricity generation, a further 20% is used in the production of peat briquettes, demand for which has remained strong. Output of the original peat briquette factory in County Kildare was expanded in the late 1940s and additional briquette factories were built at Counties Offaly and Westmeath in 1958 (Fig. 25.9). In addition, two bogs with a particularly

Fig. 25.9 Derrinlough peat briquette factor c.1960. (Source: Bord na Móna)

deep cover of sphagnum peat were developed for the production of moss peat, leading to a growth in output from 24,000 cubic meters (850,000 cubic feet) in 1946 to over one million cubic meters (35 million cubic feet) – most of it exported – in 1973.

Bord na Móna's activities received a further major boost from the oil price increases of the 1970s, which substantially enhanced peat's competitiveness as a fuel and placed a new premium on the desirability of exploiting indigenous fuel resources. A third development program was launched in 1974, under which a further 36,000 ha (90,000 acres) of peatland were acquired with the aim of adding a further 2.8 million tons per annum to production capacity. With the output from existing bogs beginning to decline, overall production did not increase accordingly but, at an average of 4.74 million tons per annum in the decade 1975–1984, was still 30% higher than in the previous decade. In order to absorb this extra output, a new briquette factory was opened in County Tipperary in 1982 and additional capacity was installed in some of the existing power stations. However, despite this increase in output, peat's contribution to total electricity production, which had already fallen from its peak of 40% in 1963 to 32% in 1975, fell further to 27% in 1985 and 16% in 1995. This reflects the fact that growth in the use of peat for power generation was not keeping pace with the overall growth of the economy and the parallel expansion in demand for electricity.

The late 1980s ushered in a major change in the way Bord na Móna's production was organized. With oil prices falling, there was growing pressure to reduce production costs and increase productivity, leading to a decision to reorganize peat harvesting around semi-autonomous production teams who were paid entirely on

the basis of the amount of peat harvested. This reorganization had the desired effect, in that peak annual employment, which had hovered between 6,000 and 7,000 since the 1950s, fell to less than 3,000 by 1995 without any significant loss of production. However, the local impact of such a dramatic fall in employment was greatly cushioned by the commencement, in the early 1990s, of the prolonged phase of national economic growth which led to Ireland being referred to as the "Celtic Tiger" (Breathnach, 1998). While most of this growth was urban-focused, rapid growth in automobile ownership allowed the associated employment opportunities to become increasingly accessible to rural dwellers (Walsh, Foley, Kavanagh, & McElwain, 2005).

Over the last 20 years, all seven of the peat-fired power stations built in the 1950s/1960s were closed, the victims of advancing age abetted, in some cases, by the exhaustion of local peat supplies. Only two of these have been replaced by new units built on adjacent sites. In addition, a third new station near Edenderry in County Offaly commenced production in 2001. The three new stations have maintained existing levels of peat consumption; however, with overall levels of Bord na Móna production showing indications of long-term decline (annual output of milled peat averaged 3.44 million tons in the five-year period 2004–2008 compared with 4.15 million tons in 1991–1995), there has been a corresponding cutback in briquette production (involving the closure of two of the four briquette factories) from a peak of over 500,000 tons in 1987 to just over 200,000 tons per annum in recent years.

25.11 Future Prospects for Peat Production

Bord na Móna expects to be able to maintain production at current levels from its existing bogs until 2030 without the need to open up new tracts of peatland for development. However, whether such an extension into new areas will actually occur is open to question. Under current circumstances, the generation of power from peat is, at best, on the margins of viability and, essentially, is a function of government policy relating to the use of indigenous fuel resources in the interests of energy security. However, the contribution which peat now makes to the national energy supply has fallen to quite a low level, due to the massive overall growth in energy consumption which accompanied the "Celtic Tiger" era. While peat still accounts for around 10% of national electricity consumption, its share of the economy's total energy requirement has fallen below 5% in recent years. Given that any new bogs which might be brought into production would inevitably be relatively small and less suited to large scale harvesting, it would require a substantial secular upward shift in the price of oil to justify the exploitation of such bogs.

In any case, opposition on environmental grounds to the further development of Irish bogs for peat production has grown enormously in recent years. With most areas of existing peatland already having been altered substantially through human intervention, there is particular concern that the few remaining areas of intact virgin bog (amounting to as little as 12% of the original raised bog area) should be

preserved in their current state in the interest of maintaining ecosystems and biodiversity (Feehan & O'Donovan, 1996; Irish Peatlands Conservation Council, 2009). In addition, large scale harvesting of peatland is a significant direct source of pollution, in that the stripping away of surface vegetation and the exposure of bare peat surfaces which this entails leads to air- and water-borne transportation of peat grains into local watercourses thereby causing, inter alia, acidification of lakes and siltation of the spawning beds of salmonids (Renou-Wilson, 2009).

Bord na Móna has sought to respond to criticisms of its environmental impacts by projecting itself as a green and environment-friendly company. It has recently adopted the phrase "A new contract with nature" as a motto to guide a proposed transformation of the company over the next two decades in pursuit of environmental sustainability. This change will involve, inter alia, Bord na Móna becoming a major producer of renewable energy and Ireland's leading waste recovery firm. Somewhat ironically, the company has developed in recent years a significant new business based on the use of peat itself as a pollution control agent (arising from its ability to absorb odors and oil and to filter and break down solids in fluid effluents).

25.12 Utilization of Cutaway Peatland

Bord na Móna will not have to face the issue of whether it should further extend peatland harvesting for quite some time and, according to the company's website, it has no current plans to acquire additional peatland for production purposes. In the meantime, a much more immediate question relates to what should be done with the growing area of exhausted peatland in the company's possession. Of Bord na Móna's total landholding of some 85,000 ha (210,000 acres), almost one-half will be exhausted of harvestable peat by 2020, with the bulk of the remainder due for expiry within a further ten years. The company has been both conducting and sponsoring research for many years into the possible alternative uses to which this "cutaway" peatland can be put. Indeed, rehabilitating this vast tract of land will comprise an exercise in earth engineering which, in terms of complexity, may surpass the initial development of the land in question for peat production. To quote Feehan and O'Donovan (1996, 474), the conversion of Bord na Móna's cutaway bogs "will be one of the great reclamation ventures of Europe, on a scale comparable to that of the English fenlands or the polders of Holland."

A wide range of possible options for the re-utilization of this cutaway peatland has been identified (Feehan & O'Donovan, 1996; McNally, 1981; Renou, Egan, & Wilson, 2006) and includes the following: grassland, horticultural uses, including vegetables and berries, mainstream forestry (including softwoods and hardwoods), short-rotation forestry and other biomass options, semi-natural wetlands/wilderness (including the restoration/regeneration of peatland environments) and recreational amenities, heritage parks, and wind farms.

The actual pattern of use from among these options will be set within parameters determined by the interaction between two sets of controlling factors. The first of

these is the physical characteristics of the cutaway bogs, including the depth of remaining peat, the composition of this peat (especially degree of humification), the nature of the underlying soils (especially their alkalinity/acidity), and the drainage requirements of particular tracts of cutaway bog (that is, whether they are free-draining or require pumped drainage). These characteristics can give rise to a wide range of configurations, even within quite small tracts of peatland. The second set of factors refers to the relative costs and benefits of the different alternative uses to which the cutaway peat can technically be put, factors which are also quite variable, not just spatially, but also over time.

Thus, for example, the viability of converting cutaway bog to grassland would have been much greater during the productivist heyday of the EU's Common Agricultural Policy in the 1970s than it is in the depressed conditions in which Irish agriculture finds itself in 2009. Conversely, population growth and overspill from Dublin into the East Midlands, combined with rising living standards and levels of car ownership, means that there is now likely to be much greater demand for the recreational and heritage qualities of the peatlands than would have been the case in the 1970s.

As recently as 2001 it was projected that, of the 40,000 ha (100,000 acres) of cutaway bog expected to become available by 2020, one-half would be devoted to conventional forestry, and 10% to grassland, with the remaining 40% (mainly areas of deep peat which otherwise would require continuous pumped drainage) reverting to wetlands/wilderness (Spatial Planning Unit, 2001). However, since then the grassland option, as we have seen, has largely lost its attractiveness while Bord na Móna's recently-stated commitment to the development of renewable energy resources has pushed the biomass and windfarm options to the forefront of its priorities. The company already operates a small windfarm on its cutaway bog in County Mayo and has recently announced plans for the installation of 500 MW of windfarm capacity (considerably in excess of the 370 MW capacity of the existing peat-fired power stations) in three locations in Counties Mayo, Offaly and Tipperary. Bord na Móna is also currently conducting trials in the production on cutaway bog of biomass suitable for energy generation and is making arrangements for the burning of biomass material in the Edenderry power station which the company itself now owns and operates.

Ultimately, however, it appears as though the principal land use to which the cutaway bogs will be put will be conventional forestry, which could take up to one-half of the total available area. Over the last 100 years, by far the main source of peatland alteration in Ireland has been afforestation, almost entirely driven by state-sponsored measures to increase the country's level of forest cover, which at the time of independence in 1922 was as low as just one per cent of the national land area (Teagasc, 2009). The Irish government's afforestation policy has been mainly effected through a state-owned company similar in format to Bord na Móna, and, while in recent decades the emphasis has shifted to promoting afforestation on privately-owned land, almost two-thirds of Ireland's forests (which now account for over 10% of the total area) are today in state ownership.

Hitherto, most afforestation has been concentrated in upland blanket bog, over one-quarter of which is now under trees, and has consisted largely of coniferous softwoods such as spruce and larch, which grow rapidly in Ireland and generate a quick financial return. Thus far, only 2% of the raised bog area has been given over to afforestation, but this can be expected to rise rapidly as cutaway becomes available. In addition, a more diverse forest cover incorporating traditional hardwoods such as oak and elm is facilitated on the lowlands, although the extent of hardwood utilization will be restricted by economic considerations (their long maturation period) and the acidic constitution of a high proportion of cutaway peatland.

25.13 Conclusion

Gilbert White (1961) pointed, many years ago, to the dilemmas which arise where multiple options are available for the use of certain resources, and where choices have to be made between these options. In such situations, White argued, the actual pattern of use may be determined as much by administrative and political considerations, and the need to resolve conflicts between "thorny and sometimes incompatible" (p. 23) special interest groups as by questions of economic efficiency. Andrews's (1982) account of the decision-making processes involved in initially embarking on the megaengineering project which the harvesting of the midland raised bogs entailed certainly bears this out. However, the range of options and the range of interest groups involved in making these decisions in the 1930s were both much narrower than those which pertain to the use of the vast tracts of cutaway bog which are the landscape legacy of this project.

Bord na Móna has anticipated the problems it may face in this respect and, in pursuit of what it terms the "wise management" of its cutaway bogs, has committed itself to building contacts with other interest groups, such as the National Parks and Wildlife Service, BirdWatch Ireland and local communities. These, it is hoped, will contribute to "the enhancement of the national biodiversity resource" and "the enrichment of our local heritage" (Bord na Móna, 2009). To an extent, Bord na Móna's task regarding the management of cutaway development is simplified by the fact that it is sole owner of the resource in question. However, should the current political trend towards the privatization of state-owned assets be brought to bear in this case, then the complexity surrounding how best the resource should be used and managed would increase enormously.

Note

1. Much of the factual material cited has been derived from various publications issued by organizations referred to in the text and from their websites. In most cases, the sources of specific items have not been given, but may be obtained on request from the author.

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