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PROSPECTS FOR MILLED PEAT PRODUCTION BY BORD NA MÓNA IN IRELAND, IN THE PERIOD TO 2030: DRIVERS AND POTENTIAL USES

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SUMMARY

Bord na Móna, the Irish State Owned Peat Company, currently produces approximately 4 Mt (million tonnes) of milled peat annually. This is used as a growing medium in horticulture, for the production of peat-based solid fuel products and in the generation of electricity.

EU and national climate and energy policies are putting continued pressure on the use of milled peat. The continued drive to decrease the carbon emissions intensity of electricity production, using instruments such as the EU Emissions Trading Scheme (EU ETS), will result in a gradual decline in the use of milled peat in the power generation sector. The imposition of carbon taxes and a drive towards peat free compost will contribute to the continued decline of peat-based solid fuels and composts.

This paper looks at the prospects for milled peat production volumes over the period to 2030. It draws on the experiences of the past and examines the key drivers likely to impact future milled peat sales as Bord na Móna gradually transitions from a peat based Company.

Key Words: milled peat, electricity, Ireland, decline

INTRODUCTION

Originally established in 1933 as the Turf Development Board (TDB), Bord na Móna has managed one of the few natural energy resources available in the country for over 75 years. Machined turf was first used in power plants in the 1950s, with milled peat use beginning in the 1960s. By 1964 peat fired generation was meeting almost 40% of the State's electricity demand (Clarke, D (2010)), which ultimately represented a peak in terms of its share of the electricity generation mix.

Table 1: Electricity Generation Fuel Mix in the 1960s & 1970s

Year	Hydro (%)	Peat (%)	Oil (%)
1964	26.0 %	39.0 %	35.0 %
1974	10.0 %	26.0 %	64.0 %

By the late 1990s the first and second generations of peat fired electricity stations (400 MW) had reached the end of their natural lives and began closing. In 1990 peat fired capacity on the Irish power system generated 19% of the country's electricity needs (SEAI, 2011). All of this

capacity would ultimately be closed by 2005. By 2001, following lengthy considerations, the Irish Government had reiterated its commitment to retaining peat fired capacity on the power system in the context of security of supply and retaining a significant portion of indigenous fuel in the generating mix. This policy ultimately resulted in the construction of three new state-of-the-art peat fired generating facilities in the period from 2000 to 2005.The plants were supported by 15-year Power Purchase Agreements (PPA's), and backed by a Public Service Obligation (PSO). The PSO effectively provides a floor price for the electricity generated and thus guaranteed their financial viability for the duration of the PPA's.

The objective of this paper is to review the historic trends in milled peat production and to assess the key drivers which generated the demand for the volumes sold. An analysis of the current policies, which are likely to impact future demand for milled peat, is also carried out. This analysis, when combined with the current demand situation and viewed in the context of historic trends, is used to derive projections for milled peat demand out to 2030.

ANALYSIS

Historic production volumes and uses

Figure 1 below indicates the long term production volumes in Ireland in the period from 1930 to 2000. It can be seen that total production volumes over the period generally exceeded 4 Mt on an annual basis, and peaked in the late 1970s and through the 1980s, where annual production volumes varied between 5 and 6 Mt.

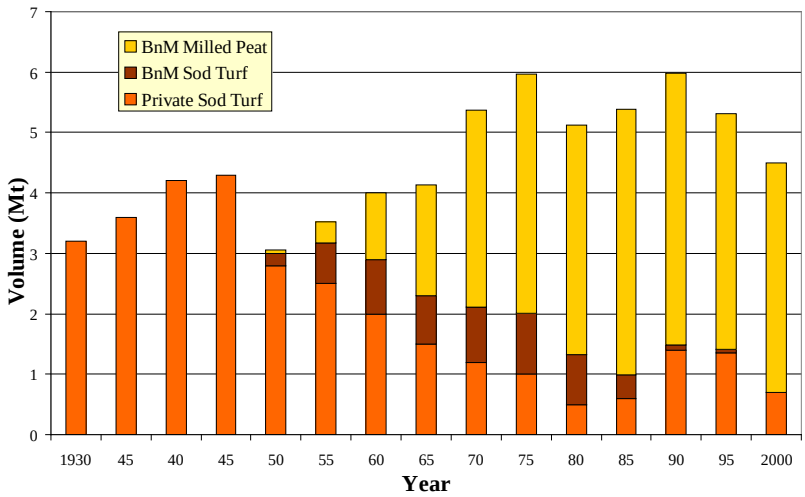

Figure 1: Peat production volumes since 1930

Up to the 1940's the Turf Development Board promoted the expansion of private sod turf production for domestic use. Milled peat production for the manufacture of peat briquettes and for supply to the ever expanding fleet of peat fired electricity generating stations commenced in the late 1940's and by the early 1960's Bord na Móna was producing about 2 Mt of peat per annum. Sales exceed 4 Mt per annum by the early 1970's, with in excess of 3 Mt being used for electricity generation. This level of sales was maintained up until the late 1990's, though total volume of peat production declined in Ireland as machine sod turf

production by Bord na Móna was phased out and private sod turf production was also in gradual decline.

Table 2 shows the level of decline in sales in the late 1990's, as the old peat fired fleet was phased out. By 1999 milled peat sales to the power generation sector had declined to about 2.7 Mt per annum from a peak of 3.3 Mt in the early to mid 1990's.

Table 2: Milled Peat Sales to ESB Power Stations 1996-2000

Year	1996	1997	1998	1999	2000
Sales (Mt)	3.3	2.9	3.0	2.7	2.8

However by 2001 an additional 1 Mt per annum of milled peat sales had been secured with the opening a new 128 MW generating station and by 2005 two further additions had been made to the peat fired generating fleet. This increased the installed capacity of the peat fired units on the Irish power system to 378 MW, with Bord na Móna securing 15 year fuel supply contracts for all three stations, amounting to approximately 3.5 Mt of milled peat sales annually.

The policy decision by the Government to continue to support peat fired electricity generation in the late 1990s, and the level of priority dispatch afforded to these units has been crucial to maintaining the level of milled peat sales generated by Bord na Móna over the last decade or so, as indicated in Figure 2.

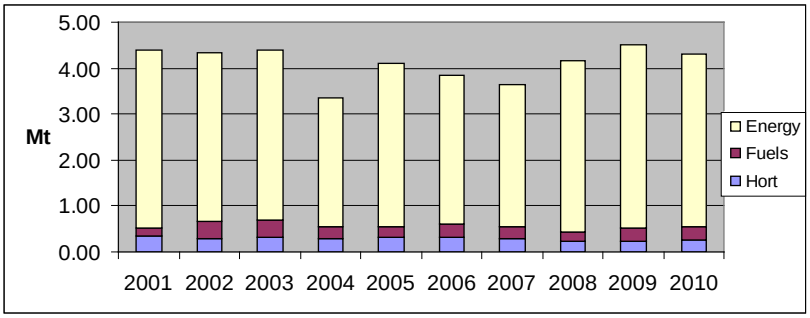

Figure 2: Break down of milled peat sales in the period from 2000 to 2010

Key considerations likely to impact future milled peat sales

In assessing future demand for milled peat it is necessary to focus primarily on the demand from the power stations, given that in excess of 80% of milled peat consumption in 2011 was in the electricity sector. The scope of this paper does not allow the key assumptions which Bord na Móna has considered in conducting electricity market modelling to be outlined. Given the relative importance of milled peat consumption in the electricity sector in terms of the impact on sales, only a brief commentary is made on the likely trends impacting future sales of milled peat for briquette manufacture or for use in the horticulture sector.

National and EU Climate and Energy Policy: Electricity Sector

From an EU and national policy perspective there are three key elements considered: sustainability, security of supply and competitiveness. Individual elements of policy inevitably focus on one or more of these pillars. Aspects of policy which are likely to impact peat fired generation in future years include:

- De-carbonisation agenda for the power generation sector, facilitating renewable generation, particularly wind, and low carbon forms of generation such as gas
- RES policy: National 40% RES-E target by 2020: expansion deals with the security of supply issue and pushes carbon intensive fossil fuels down the merit order, supported by Feed-In-Tarrifs
- Co-firing policy: accelerating decarbonisation in peat fired plants, with carbon neutral biomass displacing peat (Government White Paper, 2007)
- Electricity market design: Priority dispatch catered for in current design, but due to expire at the end of the PPA in each plant. Evolution of market design may impact priority dispatch status for peat plants post 2016
- EU ETS: full pricing of carbon impact into electricity generation militates against the use of carbon intensive fuels, such as peat, in the generation mix.

The results of electricity market modelling conducted by Bord na Móna are detailed in the fuel mix projections for 2020, outlined in Figure 3(BNM, (2011)). This allows us to assess future demand for milled peat in the electricity sector. The comparative fuel mix for electricity generation in 1990 and 2010 clearly demonstrates the impact the EU and national energy policy, with its clear focus on decarbonisation, as well as electricity market reform, is having on the generation mix on the Irish power system. In 1990, peat provided 19% of electricity generated. By 2010 electricity market liberalisation and the clear focus on the climate agenda resulted in peat's share in the generation mix falling to 8%. This share has been maintained, primarily by the decision in the late 1990's to retain peat in the electricity generation mix from a security of supply perspective, and to afford it price support and priority dispatch in the electricity market.

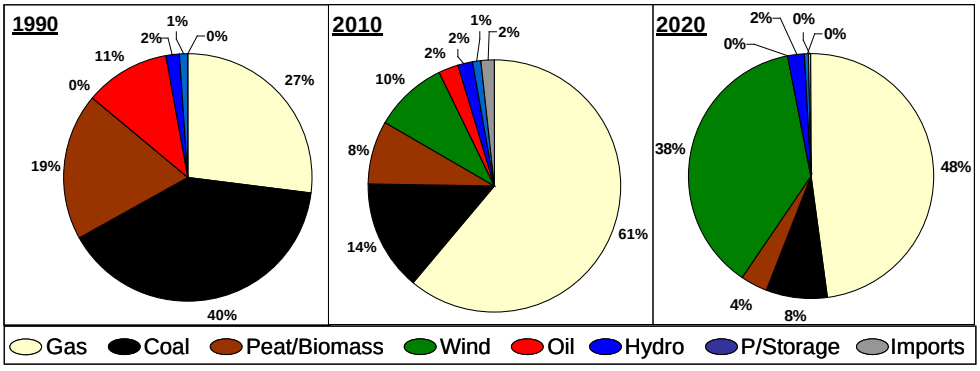

Figure 3: Electricity Sector Fuel Mix 1990 – 2020 (forecast)

The continuing focus on delivering Ireland's 2020 renewable electricity target of 40% will result in wind generating up to 38% of electricity by 2020. Along with some biomass co-firing in the peat stations and hydro generated electricity the 40% RES-E target should be

achieved domestically. Co-firing has become firmly established in Irish energy policy and the provision of a fixed feed-in tariff (REFIT III) support mechanism to encourage further expansion of biomass co-firing in the peat stations will ensure that the continued decline in peat volumes will accelerate, even prior to the expiry of the current PPA's.

RESULTS: MILLED PEAT SALES PROJECTIONS TO 2030

In spite of the ongoing support provided for peat fired electricity generation, which will continue until the PPA's expire at the existing peat fired stations, the issues highlighted in the analysis in section 2.0, have put ever increasing pressure on the industrial production and use of milled peat. This will result in continuing decline of sales, as outlined in the median scenario depicted in Figure 4.

With carbon now fully priced in to wholesale electricity prices, peat fired generation will continue to fall down the merit order for dispatch, resulting in ever increasing levels of PSO support required to allow peat retain its share in the generating mix. This single issue alone means that no further support will be afforded to peat fired generation and this will result in a significant decline in milled peat volumes used in electricity generation over the next decade or so. Volumes will decline slowly in the period to 2015, with increased biomass co-firing over the period driving that modest decline. However, in 2015/16 once the current PPA expires at Bord na Móna's Edenderry facility, and priority dispatch is no longer afforded, peat sales volumes will decline by approximately 0.5 Mt. In 2019/20 further significant declines in peat fired generation are anticipated once the PPA's expire at the other two peat fired generating stations.

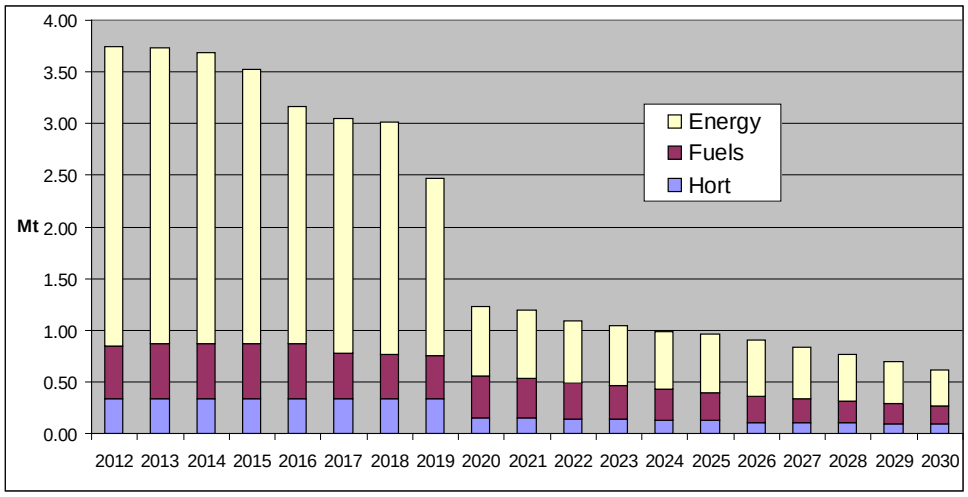

Figure 4: Projections of milled peat sales to 2030 (Central Scenario)

By 2020 it is anticipated that milled peat sales to the power generation sector will have declined to less than 1 Mt per annum. Ongoing declines in milled peat use in the other sectors will mean that total sales in 2020 will not exceed 1.2 Mt. From 2020 to 2030 it is anticipated that the rate of decline in milled peat sales will likely slow, as the anticipated increased cost of gas fired generation in particularly may see "in merit order" peat fired generation occurring regularly during periods of high electricity demand. As a result total milled peat demand in

the electricity sector may still hover around 0.25 Mt by 2030, with the increased provision of cost effective biomass for use in the existing facilities being key to the reduced milled peat requirements in the latter part of that decade.

CONCLUSIONS

The paper concludes that demand for milled peat will decline from 4 Mt per annum today to little more than 0.5 Mt in 2030 and will be characterised by a number of significant year-on-year demand reductions as a result of well defined events. This decline will occur on a phased and gradual basis and peat will likely remain as a component in the Irish energy mix until 2030. Although demand will only decline slowly until 2015, a significant decline in demand is anticipated thereafter, primarily as a result of the cessation of priority dispatch and the associated price support for peat fired generated electricity. This is being driven by the ever increasing focus on the climate and renewable energy agenda.

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