through natural and artificial channels to discharge into the main stream. The seepage communities are characterised by patches of black bog rush *Schoenus nigricans*, sharp-flowered rush *Juncus acutiflorus*, moorgrass *Molinia caerulea*, several sedges *Carex panicea*, *C.flacca*, *C.hostiana*, *C.viridula* and *C.pulicaris* and mosses such as *Campylium stellatum* and *Drepanocladus* spp. Other species are:

Briza media	quaking grass
Succisa pratensis	devilsbit
Potentilla erecta	tormentil
Anagallis tenella	bog pimpernel
Pinguicula vulgaris	butterwort
Hydrocotyle vulgaris	marsh pennywort
Eleocharis uniglumis	spike rush
Triglochin palustre	arrowgrass
Pedicularis palustris	red rattle
Parnassia palustris	grass of Parnassus
Equisetum palustre	marsh horsetail
Achillea ptarmica	sneezewort
Epipactis palustris	marsh helleborine
Euphrasia cf *scottica*	eyebright

5.27 Slightly richer places where water flows or is ponded, bring in common sedge *Carex nigra*, ragged robin *Lychnis flos-cuculi*, water mint *Mentha aquatica*, meadow vetchling *Lathyrus pratensis*, jointed rush *Juncus articulatus*, bog cotton *Eriophorum angustifolium* and silverweed *Potentilla anserina* while the channels and nearby banks have a selection of the following species:

Galium palustre	marsh bedstraw
Nasturtium officinale	watercress
Apium nodiflorum	fool's watercress
Lemna minor	duckweed
Menyanthes trifoliata	bogbean
Ranunculus flammula	spearwort
Epilobium palustre	marsh willowherb
Angelica sylvestris	wild angelica
Caltha palustris	marsh marigold
Juncus acutiflorus	sharp-flowered rush
Dactylorhiza fuchsii	spotted orchid
Equisetum fluviatile	water horsetail
Persicaria amphibia	amphibious bistort
Sparganium erectum	bur reed
Carex riparia	pond sedge
C.disticha	brown sedge
Pulicaria dysenterica	fleabane

5.28 A fringe of wet grassland with a varying calcareous influence occurs above and west of the fen area involving such species as crested dogstail *Cynosurus cristatus*, hard rush *Juncus inflexus*, meadow fescue *Festuca pratensis*, self-heal *Prunella vulgaris*, marsh thistle *Cirsium palustre* and marsh ragwort *Senecio aquaticus* along with occasional mat grass *Nardus stricta*. Just at the field border to the south there is soft rush *Juncus effusus*, cinquefoil *Potentilla reptans*, great willowherb *Epilobium hirsutum*, hoary willowherb *E.parviflorum* and tufted hairgrass *Deschampsia cespitosa* with occasional fox sedge *Carex otrubae* and red bartsia *Odontites vernus*.

Fauna

Vertebrates

5.29 The mammal fauna includes hare, fox and brown rat and there may be occasional visits by young otters without territories. However, there is no suitable feeding or breeding places. The common frog and newt also occur.

5.30 Birds seen on site visits were mallard, moorhen, snipe, meadow pipit, skylark, reed bunting and hedgerow species such as blackbird, robin, dunnock, wren, chaffinch, goldfinch and greenfinch. Rook, jackdaw and hooded crow also make some use of the area with curlew in winter.

Invertebrates

5.31 A molluscan survey of the fen section of the Commons was done by Evelyn Moorkens in January 2000 with the objective of discovering whether any of the protected *Vertigo* species of snail occur. The weather was bright and sunny, but too cold to find many snails by hand, and in some places a thick layer of ice had to be removed before samples of vegetation could be taken.

Materials and Methods

5.32 Mollusca were sampled to some extent by hand, but mainly by taking a series of 6 samples of between 2 and 3kg of vegetation, which were wet sieved through two mesh sizes, 3mm and 0.5mm. The contents of each sieve were dried and examined for snails. An Olympus 40X binocular microscope was used to examine the smaller species.

Results

5.33 A total of 22 species of snail were found at this site, as detailed in Table 5.1 below.

Table 5.1 Molluscan species found in fen at Duleek Commons

Species	Wettest Area	Intermediate Area	Driest area
Valvata cristata	x		
Carychium minimum	x	x	
Carychium tridentatum	x	x	x
Aplexa hypnorum	x	x	
Lymnaea truncatula	x		
Lymnaea palustris	x	x	
Anisus leucostoma	x		
Succinea putris	x	x	
Cochlicopa lubrica	x		
Columella aspersa	x	x	
Vertigo antivertigo	x		
Vertigo substriata	x		
Vertigo pygmaea	x	x	
Lauria cylindracea	x		
Punctum pygmaeum	x		
Aegopinella pura	x	x	
Euconulus alderi	x	x	
Trichia hispida	x	x	
Pisidium casertanum	x		
Pisidium personatum	x		
Pisidium milium	x		
Pisidium nitidum	x		

Evaluation

5.34 The species found in this survey represent a good range of marsh species found in Ireland, and in general form a set of species of a habitat which can dry out and become inundated with water at various times of the year. There were no rare or protected species in any of the samples. There were three species of *Vertigo* found, all representative of wet conditions. It is unlikely that any of the protected *Vertigo* species would be found here. The water levels do not appear to be stable enough to support *Vertigo geyeri* or *Vertigo angustior*, and the vegetation species are not tall enough to support *Vertigo moulinsiana*. There were no slugs found in this survey. They are difficult to find in cold weather, as they tend to retreat underground or into crevices in these conditions. It is expected that a range of common slugs is likely to occur but there are no rare or protected slug species from this broad habitat type.

Conclusion

5.35 Duleek Commons is an important wetland with two distinct vegetation types - the wet grassland (and occasional marsh), between and around the stream channels, and the rich fen fed by springs at the southern edge. This latter community is rare in the county generally because of the drift cover over limestone and comparable examples occur mainly in the west, close to Co. Westmeath. The few local fens, e.g. Greenanstown are smaller in extent than the Commons and less secure in management terms.

5.36 Because of the small area of fen the Commons is one of few sites in Meath where plants *Schoenus nigricans*, *Achillea ptarmica*, *Epipactis palustris* and also *Nardus stricta* occur. More notably it supports *Eleocharis uniglumis* which is normally maritime and has been found at only five stations inland.

5.37 The molluscan fauna does not appear to be unusual. Other groups have not been examined as far as is known.

Impact of proposals

5.38 The groundwater regime in this locality has become better known recently because of the drilling programme connected with the development (see Chapter 7), and it appears that restricting the development of the final quarry floor will ensure that the groundwater flow to the fen will continue unaffected. This being so the development will not compromise the future of the Duleek Commons Natural Heritage Area.

Duchas Report

SITE SYNOPSIS

SITE NAME: DULEEK COMMONS

SITE CODE: 001578

About 1km northwest of Duleek, Duleek Commons Natural Heritage Area (NHA) occupies a level, drained marsh area that was associated with the floodplain of a tributary running from Thomastown Marsh, through the undulating drift landscape to the River Nanny.

The area has suffered a certain amount of drainage activity and is now fairly dry around the periphery, where is found rushy pasture with both Soft and Hard Rush (Juncus effusus and J. inflexus) grazed by cattle. The centre is somewhat wetter, with wetland herbs such as Water Mint (Mentha aquatica), Water Forget-me-not (Myosotis sp.) large stands of Yellow Flag (Iris pseudacorus), Jointed Rush (Juncus acutiflorus) and bulky sedges (Carex sp.). The rare spike-rush (Eleocharis uniglumis) has been recorded here in one of its very few inland stations. This may be supported here by the high calcium content that is also indicated by the presence of Hard Rush.

Many wetlands in the area have completely disappeared due to drainage. Duleek commons is in relatively good condition, probably due to being in multiple ownership. Thus this rather degraded wetland is of importance. Further drainage work here would be inappropriate.

□

7 WATER

Receiving Environment

Geology

7.1 The regional bedrock geology for the Platin area is taken from the geology of Meath map as published by the Geological Survey of Ireland (GSI) and dated 1999 (Figures 7.3 and 7.6). The Carranstown Cherty Limestone (Figure 7.6) is not recognised as a Formation or Member within the Platin Formation by the GSI publication but does represent an important local horizon within the context of the Platin Quarry extension.

Bedrock

7.2 Platin Quarry is excavated into the limestone bedrock belonging to the Platin Formation (Figure 7.6). These limestones are part of the Carboniferous succession which here occupies a synclinal structure (Figure 7.3) located between the sandstone cored Lower Palaeozoic Massifs found to the north and south of the Rivers Boyne and Nanny, respectively. Namurian aged sandstones and shales of the Walshestown, Balrickard and Donore Formations occupy the axis of the syncline. The limbs of the east-west trending syncline consist of Dinantian age limestones of the Platin, Clonlusk and Mullaghfin Formations. The Slane (just off Figure 7.3 to the north) and Nanny Faults bound the northern and southern edges of the graben like structure, respectively.

7.3 The Platin Formation consists of crinoidal, peloidal grainstone and packstones. To the east of the existing quarry the Platin Formation contains abundant dolomite and is unsuitable for cement manufacture due to the high magnesium content. Westwards, the presence of the Carranstown Cherty Limestones together with the property boundary and the adjoining public road define the outline of the proposed extension (Figure 7.6). The Carranstown Cherty Limestone is unsuitable for cement manufacture due to the high silica (SiO_2) content and associated high abrasiveness.

7.4 The Carboniferous succession at Platin dips to the northwest towards the synclinal axis and is traversed by faults trending north-northwest by south-southeast. The faulting has no appreciable effect on the limestone chemistry except for local patches of dolomite in the fault zones, but in the quarry area the faulted areas are generally weaker and tend to have abundant solution fissures filled with clay and rubble.

7.5 The limestones at Platin display a range of karst features particularly in the upper bench levels where the solution features are generally filled with clay and rubble. Immediately to the north of the quarry at Cruicerath the local drainage discharges into a swallow hole and emerges in the quarry face south of the intervening public road.

Shown on the G.I.S. Map

Overburden

7.6 The rock surface outcrops in the areas shown in Figure 7.7. Elsewhere the bedrock surface is covered by a variable thickness of glacial till. The overburden contours presented in Figure 7.7 indicate a zone of thick till cover passing from Duleek Village and extending into the eastern edge of the proposed extension. In the west of the extension area the glacial till is of the order of 5m thick and this increases eastwards to where the overburden is thickest (over 20m) immediately behind the present quarry face as indicated in the cross sections A-A' and C-C' of Figure 7.4, presented in Figure 7.9.

Duleek Commons

7.7 The wetland referred to as Duleek Commons is located in a topographic hollow in the glacial overburden covering the limestone bedrock. Monitoring boreholes completed around the margins of the wetland indicate an overburden succession consisting of glacial tills with some sand and gravel horizons. Generally a brown boulder clay layer is overlain by a brown clay layer, with a suggestion that the succession contains more sand and gravel towards the west (Borehole logs are presented in Appendix 2-2).

Reserves

7.8 The area west of the existing Platin Quarry is suitable geologically as a source of limestone for cement manufacture.

7.9 It is proposed to extend the existing quarrying operation westwards as indicted in the cross sections given in Figure 7.9, effectively doubling the floor area of the existing quarry. The available reserves in the extension will be won through a series of benches similar to the practice in the existing quarry with the final floor level of minus 20m below Ordnance Datum (OD) being the same over the extended excavation. The scheduling of the benching operation in the extension would allow for the economic mixing of overburden stripping and the excavation of the usable reserves (See section 3.13).

Other Quarrying at Duleek and Donore

7.10 In addition to the Platin Quarry other quarrying operations in this part of County Meath include:

- Premier Periclase Quarry;
- Donore Shale Quarry;
- Irish Asphalt Quarry.

The location of these operations is shown in Figure 7.3.

Water

Surface Waters

7.11 Platin Quarry is located in the River Nanny Catchment close to the watershed with the River Boyne (Figure 7.2).

7.12 The River Nanny drains 250 km^2 and rises in the east of County Meath before flowing to Duleek to discharge into the Irish Sea at Laytown. The River Boyne drains a catchment nearly 10 times the size of the River Nanny at 2,300 km^2. It rises in counties Offaly and Kildare and drains most of County Meath before flowing through Drogheda to discharge into the Irish Sea at Mornington in County Meath.

7.13 The Office of Public Works operates a number of gauging stations on both the Rivers Nanny and Boyne. The flows measured at gauging station 0811 at Duleek (Figure 7.2) on the River Nanny together with the flows at the Slane Castle Station on the River Boyne are provided in Appendix 2-1. There is no further hydrometric station on the Boyne between Slane Castle and the Platin area.

7.14 Recent reliable flow measurements have been taken by the OPW on the Boyne at Slane Castle. These indicate that the summer low flows in the Boyne at Slane are in the range 2.5 m^3/sec. The summer low flows in the Platin area, some 10 kms further down stream, can be confidently taken as being greater than 2.5 m^3/sec or 200,000

m^3/day. The lowest flow recorded from the Nanny at Duleek is 0.04 m^3/sec or 3,500 m^3/day.

7.15 Drainage between the quarry and the catchment divide with the River Boyne to the north now drains into the quarry through a solution feature exposed in the quarry face. This drainage is shown in the Ordnance map of the area as historically flowing to a swallow hole at Cruicerath and then rising to the south of the quarry where the principal drainage still rises today.

7.16 Westwards of the planned extension, a tributary of the River Nanny (here called the Commons River) rises in Thomastown Marsh (now a forest) and flows eastwards into the Duleek Commons wetland before entering the River Nanny just south-east of Duleek Village. This stream together with a contribution from north of the Commons has a catchment of some 9.4 km^2 above its exit from Duleek Commons. Flow measurements taken in June and August of 2000 indicate that the summer outflow from Duleek Commons is in the range 0.003-0.01 m^3/sec or 260-860 m^3/day.

7.17 Historically, it would appear that the stream rising in Thomastown marsh was used to power a corn mill just northeast of Duleek village. The connecting millrace is still seen as it exits the Commons but today does not carry the outflow from the Commons. Instead, the Commons River now flows through Duleek Village and discharges into the River Nanny to the south of the village.

7.18 It would appear that the marshy area east of the Commons was also an integral part of the supply to the mill but which today drains southwards directly into the River Nanny. As both the Commons and this marshy area are at a similar elevation they probably were used as water storage features to drive the mill in dry weather conditions.

Drainage Pattern

7.19 The surface drainage pattern (Figure 7.3) at Duleek and Platin is largely determined by the underlying geology and by historical harnessing of the available water supplies. On the larger scale, the lower reaches of the Rivers Boyne and Nanny are determined by the trace of the Slane and Nanny Faults which separate the softer limestones from the harder sandstones. Locally, the catchment divide separating the Rivers Boyne and Nanny near Platin is defined by the high ground underlain by the more resistant Namurian sandstones and shales.

7.20 Southwards of the catchment divide, the surface drainage flowing off the Namurian strata flows into a swallow hole that developed in the Platin Formation limestones at Cruicerath. Westwards, the Commons River rises at the junction between the limestones and the younger sandstones and shales at the elevation of the local drainage network. This is also reflected in the spring line associated with the 30.5 m OD (100 ft.) contour with risings at the Commons, Carranstown, Caulstown and Annagor along the northern bank on the River Nanny. The permanent drainage network rises south of the railway line as the water table in the limestones meets the falling topography at a general elevation of approximately 30.5 m OD.

potential source of future water supplies

Quarry Drainage

7.21 Dry working conditions are maintained in the Platin excavation by deep well and sump pumping. The combined drainage from the quarry and related plant is pumped to the River Nanny at the licensed discharge location shown in Figure 7.2. Pumping rates from the quarry have been reported in the range 4,400-6,300 m^3/day.

7.22 Currently, the groundwater pumped from Platin Quarry is piped directly to the River Nanny at the discharge point shown on Figure 7.2. The company has undertaken to pipe the additional quarry drainage to another discharge point indicated on Figure 7.2.

This additional quarry discharge point is intended as a mitigation measure to minimise any impact of the quarry dewatering on the low flows in the River Nanny immediately downstream of Duleek Village.

Groundwater

7.23 Geologically, Platin Quarry is located in a narrow band of Carboniferous aged limestones that are bounded to the north and south by older Lower Palaeozoic sandstones and shales. The Platin limestones connect westwards with the limestone plains of Meath and extended eastwards to outcrop along the Irish Sea between Termonfeckin in the north and Laytown in the south.

7.24 The Platin limestones constitute a regionally important aquifer while the enclosing Lower Palaeozoic strata have little regional groundwater potential. Groundwater within the limestone aquifer flows towards the east coast and either discharges directly into the Irish Sea or into the River Boyne and River Nanny systems as base flow. The pumping of groundwater from beneath the quarry to maintain dry working conditions has altered the natural groundwater flow regime around the quarry. Some of the groundwater that would previously have discharged into the two rivers as base flow has been intercepted beneath the quarry and this groundwater is now discharged to the River Nanny at the licensed outfall.

7.25 This proposal to extend the quarry as indicated in the plans and cross sections will result in an increased dewatering rate as the final quarry floor area is effectively doubled. The increased abstraction will further alter the natural groundwater flow regime around the quarry with the scheduling of this further reduction in the water table and increased dewatering rate being determined by the quarrying programme over the life of the quarry.

7.26 The available reserves in the extension will be won through a series of benches similar to the practice in the existing quarry with the final floor level of minus 20m below OD being the same over the total excavation. The scheduling of the benching operation in the extension will allow for the economic mixing of overburden stripping and the excavation of the usable limestone reserves. The position of the water table at the completion of the present quarry permission is indicated in Figure 7.9. The extension of the quarry area westwards will entail a further lowering of the water table in this direction as the floor intersects the water table position maintained for the present permission.

7.27 The wetland at Duleek Commons is dependent on the local water table and the inflow from the Commons River. The measured groundwater contours around the margins of the wetland indicate that it receives groundwater from spring risings located within the marshy area. The outflow from Duleek Commons was historically directed to a corn mill to the north east of Duleek village. Today, the outflow is directed through the village and discharges into the River Nanny.

Data Base

7.28 The available groundwater data base includes records from 40 boreholes completed on company property and on adjoining public lands details of which are tabulated in Appendix 2-2 for reference and located on Figure 7.4. In addition, information is available from some 55 private wells (Figure 7.5) located around the quarry of which 20 are reported in use while the remainder are no longer in use. Details of the private wells are given in Appendix 2-2.

7.29 Groundwater level monitoring has been undertaken at Platin since January 1996 and the available data is presented in Appendix 2-2 for both the Company monitoring boreholes and the private well network. The company has an active groundwater

level monitoring programme in place and this will continue in compliance with existing permissions and commitments.

7.30 The water table levels recorded from the monitoring well network for the spring of 2000 are presented in Figure 7.8 in plan view and also incorporated into the cross sections given in Figure 7.9. This groundwater flow pattern represents the steady state flow regime now established by the dewatering programme that has been operational at the existing quarry since the mid 1980's.

Present Groundwater Flow Pattern at Platin

7.31 The dewatering of Platin Quarry is primarily achieved through a single deep pumping well referenced in the accompanying drawings as PW2. This practice has been in operation since 1985 with the dewatering rate increasing steadily since 1995 in keeping with the progressive deepening of the quarry floor. The location of the pumping well has changed over the intervening period, as each operating well has had to be abandoned to allow for the deepening of the quarry floor.

7.32 The practice to date has been to provide a single well for each level and to replace the operating well with a new well as each deeper level was excavated. Older wells were then removed as blasting and quarrying extended across the new floor level. The use of a single well located towards the centre of the excavation has managed to maintain the water table below the base of the excavation with the cone at or close to the toes of the advancing quarry face and quarry margins.

7.33 The quarry has now been excavated to an elevation of 0m OD (i.e. zero metres Ordnance Datum). The continuous abstraction of some 4,400-6,300 m^3/day has lowered the original water table from approximately 35m above OD to the current floor level elevation at 0m OD. The dewatering rate varies with the seasons with the higher pumping rates coinciding with periods of wet weather. Similarly, prolonged dry periods result in lower abstraction rates. The existing regulatory permissions allow for the deepening of the quarry floor to an elevation of minus 20m OD (Ref.: Meath Co. Co. P98/187) and the discharge of some 15,000 m^3/day into the River Nanny at the licensed outfall (Integrated Pollution Control Licence (No. 268), Schedule 2(i).

7.34 Figure 7.9 indicates the present position of the water table at, and surrounding, the Platin excavation and shows how it relates to the current floor level, the final floor level for existing quarry permission and the situation for the proposed extension. This picture, together with the position given in Figure 7.8 shows how the current dewatering regime has generated a cone of depression in the water table centered on the deepest part of the quarry. The regional west to east flow of groundwater has been altered in the vicinity of the quarry as indicated in Figure 7.8.

7.35 Monitoring boreholes completed by the Company in 2000 between the quarry and the River Nanny indicate that the cone has not spread as far as the River Nanny. The measured groundwater levels show how there is still a positive flow of groundwater to the River Nanny with a ridge in the water table remaining between the quarry and the River Nanny.

7.36 The discharge of the pumped groundwater from Platin into the River Nanny prevents any loss of base flow to the lower reaches of the river as a result of the quarry dewatering. In fact, the River Nanny gains in this regard as some 42% of the pumped groundwater is estimated as being captured by the Platin excavation from the River Boyne catchment. This loss of base flow to the lower reaches of the River Boyne is not significant while the gain to the River Nanny is a definite positive feature as the River Nanny is characterised by a particularly low flow regime.

Future Groundwater Flow Pattern at Platin

7.37 The present groundwater flow pattern around the Platin excavation will continue to change as the quarry floor is progressively deepened under the existing permission and subsequently as the floor is extended westwards under the current proposals. The availability of the current and historical groundwater levels from the Platin area provides the necessary data base on which to evaluate the impact of the current dewatering programme on the groundwater flow regime and to predict the likely scenario resulting from the dewatering of the proposed extension. This information has been incorporated into the design of the excavation by limiting the westward extend of the final quarry floor (-20m O.D.) and the –5m O.D. floor level, to minimise the potential impact on Duleek Commons. The longevity of the monitoring record and the availability of monitoring boreholes away from the excavation adds considerable confidence to the analysis of the groundwater flow patterns both presently and into the future. Of equal importance is the extended time frame over which the proposed extension will take place, which will allow for the continued monitoring of the water table and comparison with the predicted scenario.

7.38 Lowering the water table to -20m OD at the existing excavation with an abstraction of some 7,000-9,000 m^3/day will have the effect indicated in Figures 7.9 and 7.10 with the cone of depression extending further away from the excavation. The deepened cone will retain the same gradient as presently measured between the quarry margins and the nearby monitoring boreholes. The observed ridge in the water table will remain between the quarry and the River Nanny. This will ensure that there should not be any leakage through the bed of the River Nanny and that the pumped groundwater will continue to provide a positive gain in the base flow in the River Nanny downstream of the quarry discharge. The positive gain will be due to captured groundwater flow from the River Boyne catchment.

7.39 Extending the quarry floor westwards will require a progressive increase in the abstraction rate as each new bench is opened over the lifetime of the reserve. A review of the company's Integrated Pollution Control Licence will be required when the abstraction rate nears the 15,000 m^3/day permissible. At the final quarry floor level of -20m in the proposed extension, an abstraction rate in the range 14,000-18,000 m^3/day will be required. The resulting cone of depression will be elongated along the line of the extension as indicated in Figure 7.9. This will have the effect of moving the capture zone of the Platin excavation westwards towards the Commons River catchment. However, restricting the development of the final quarry floor (-20m O.D.) and the –5m O.D. floor level to not less than 700m and 300m respectively from the western property boundary has the effect of maintaining the wetland catchment.

Groundwater Quality

7.40 The groundwater abstracted from the quarry is partly used in the cement making process while the remainder is pumped directly to the River Nanny. As the dewatering operation is based primarily on deep water wells, the discharge water tends to have a good colour and to be free of suspended solids. These show the pumped water to be a typical limestone groundwater displaying an elevated hardness and a pH of 7.2. The pumped groundwater meets potable standards for the parameters tested and shows no sign of contamination as a result of the quarrying or cement making operations.

Potential Potable water Supply *

Surface Water Quality

7.41 Chemical analyses of samples taken from the River Nanny in July 1996 at locations immediately above and below the quarry's discharge are given in Appendix 2-2. These indicate that the summer flow in the River Nanny has broadly the same chemical character as the groundwater pumped from the Platin limestones. In this situation, the flow in the River Nanny is dominated by groundwater discharging from

the limestone aquifer. Comparison of the up-stream and downstream analyses shows little significant variation.

Meteorology

7.42 The meteorological office maintains a rainfall station at Duleek village. The 30-year annual average rainfall for this station is 802mm as measured during the period 1951-1980. The monthly averages vary from a low of 51mm in April to a high of 87mm in December. The evapotranspiration figures from Dublin Airport indicate a high of 102mm for August. The average monthly rainfall is lower than the average evapotranspiration during the months April to August. In the remaining 6 months, the rainfall exceeds evapotranspiration with the greatest of rainfall surpluses being recorded in the months November, December and January. The monthly averages of rainfall and evapotranspiration for the Platin area are tabulated in Appendix 2-1.

Impacts of Development

7.43 Water discharges from the quarry and the cement plant are governed by conditions attaching to the Integrated Pollution Control Licence (Register No. 268), issued by the Environmental Protection Agency. Surface water and groundwater are currently monitored, analysed and discharged in conformance with the requirements of this licence.

7.44 Quarry operation at the final floor level of -20m O.D. in the proposed extension will require an increased water abstraction rate, the lowering of the water table at and around the quarry and the extension of the cone of depression associated with the existing dewatering operation. The increased volume of water to be pumped from the quarry will primarily be a function of the permeability and storage of the host limestone bedrock, the recharge to the groundwater regime and the relationship between the groundwater system and the Rivers Boyne and Nanny.

7.45 The availability of current and historical water table measurements at and around the existing excavation provides a most useful database on which to base an analysis of the present level of impacts and to predict the likely scale of impacts associated with the proposed quarry extension. As the extension will be developed in similar geological and hydrogeological conditions to the present quarry it is reasonable to assume that the water level observations relating to the present dewatering can be confidently extrapolated into the extension. In particular it is assumed that the same order of transmissivity and storage found in the Platin Formation at the existing workings will also be present in the extension to the west. The drilling programme carried out indicates that the same fracture flow conditions prevail in the extension with a similar wide variation between low and high yielding boreholes.

7.46 The dewatering of the extension will impact on the local water table and this will have minor implications for the local drainage pattern, the Rivers Boyne and Nanny, private wells and Duleek Commons.

Impact on Boyne and Nanny Rivers

7.47 The increased dewatering rate at the quarry will not draw water directly from either the Boyne or Nanny Rivers, as the cone of depression will not extend that far. It will, however, abstract groundwater that otherwise would have flowed to both the Boyne and Nanny Rivers. It is estimated that approximately 42% of the groundwater pumped at the quarry will originate in the River Boyne catchment and this will cause a reduction in the total base flow in that catchment. However, this loss will be relatively small in the context of the Boyne catchment but will be an important gain to the Nanny River.

7.48 The average annual base flow in the Boyne at the Slane gauging station has been calculated as $7x10^8$ m^3. The withdrawal of the maximum 18,000 m^3/day from the extended Platin quarry represents a reduction of less than 0.5% of the annual Boyne base flow measured at the up stream gauging station at Slane. This impact will be even smaller with respect to the base flow in the Boyne in the Platin area, which is a further 10 km downstream of Slane. The projected maximum groundwater abstraction from the Platin excavation will therefore have no significant impact on the Boyne base flow in the lower reaches of this large river catchment. Neither will there be a discernable impact on water levels in the Boyne, even in periods of low flow.

7.49 The observed groundwater flow pattern indicates that the current dewatering programme retains a positive flow of groundwater to the River Nanny to the south of the quarry. It is expected that this groundwater ridge will remain for the dewatering of the quarry under the present permission. The discharge of the pumped groundwater to the River Nanny at Duleek removes any impact of the quarry on the base flow in the river immediately downstream of the village.

7.50 The present analysis of the groundwater flow pattern indicates that the groundwater ridge to the south of the quarry will remain between the quarry and the River Nanny for the life of the extension. However, the cone of depression could extend to the River Nanny around Beaumont Bridge and leakage from the River Nanny could take place here. However, the net increase in the base flow arising from the increased discharge should compensate for any loss through the stream bed along this stretch.

7.51 The expansion of the cone westwards will reduce the flow in the springs feeding the streams rising to the south of the railway line. Also, the marshy area to the north east of Duleek will be impacted with the contributing catchment reduced in size. However, as the groundwater ridge will remain here, it is unlikely that this wet area will dry up completely.

Impact on Duleek Commons

7.52 The groundwater contours measured in the monitoring boreholes indicate that the present quarry operation has not impacted on the groundwater flow to Duleek Commons. Also, the deepening of the quarry to minus 20m OD will not impact on the wetland. The extension of the quarry westwards would have the potential to alter the groundwater catchment contributing to the wetland. However, restricting the development of the final quarry floor (-20m OD) and the –5m OD floor level to not less than 700m and 300m respectively from the western property boundary will have the effect of maintaining the wetland catchment.

Impact on Private Wells

7.53 The lowering of the regional water table will impact on domestic wells located within the cone of depression associated with the quarry operations. The magnitude of this impact will be a function of the depth of each domestic well, it's proximity to the quarry and the depth of water over the pump intake. Shallow wells located close to the quarry would be most affected by the additional abstraction, while deep wells some distance from the quarry will be least impacted. The company is committed to the continued monitoring of water levels in private wells, as has been the case since 1996. The company has undertaken to remedy any impact on private wells with the agreement of the well owner where the impact results from the quarry dewatering programme. The location of existing private wells and extent of the existing mains water supplies is shown in Figure 7.5.

Impact on Groundwater and Surface Water Quality

7.54 The abstraction of additional volumes of groundwater from the same aquifer is unlikely to alter either the physical or chemical character of the pumped groundwater. The quality of the quarry dewatering discharge is unlikely to change in response to the increased abstraction rate. In these circumstances the discharge water will have no significant impact on the receiving waters as the pumped groundwater should continue to meet potable water standards for colour, turbidity, major ions and trace elements.

Mitigation Measures

River Nanny

7.55 Diverting the additional quarry outflow immediately downstream of Duleek ensures that this water will be available to the River Nanny within the zone of influence of the quarry dewatering. This should be a major benefit to the River Nanny during the low flow periods, as the quarry discharge will provide a net increase into the River Nanny by way of groundwater captured from the River Boyne catchment. In periods of high flow the discharge will revert to the present position as the impact at high flows has been shown to be negligible below this point on the River Nanny. Flows in the River Nanny will be reviewed annually to confirm that there is no negative impact.

Private Wells

7.56 The deepening of the Platin Quarry will result in a slow and continuous lowering of the water table as the excavation extends below the present floor level. The company will monitor the impact of the dewatering by reference to the monitoring boreholes already in existence and for which some base line water level data is already available. The monitoring of the company's well network will provide the earliest notification of any impact resulting from the deepening of the quarry. This approach will allow the company to put in place a range of effective mitigation measures that will include:

(i) the deepening of impacted wells;
(ii) the drilling of new wells; or
(iii) the provision of piped water supplies.

Duleek Commons

7.57 The wetland at Duleek Commons is an integral part of the groundwater system at Platin and the excavation to date has had no impact on the groundwater flow to the wetland. The extension to the west would have the potential to alter the groundwater flow pattern around the wetland. However, restricting the development of the final quarry floor (-20m OD) and the –5m OD floor level to not less than 700m and 300m respectively from the western property boundary has the effect of maintaining the wetland catchment. This position can be monitored over the life of the quarry with reference to the monitoring well network now established around the excavation and at the wetland.

EUROPEAN PARLIAMENT

1999 *2004*

Consolidated legislative document

4 July 2001

2000/0116(COD) – PE2

***II
POSITION OF THE EUROPEAN PARLIAMENT

adopted at second reading on 4 July 2001 with a view to the adoption of European Parliament and Council Directive 2001/.../EC on the promotion of electricity produced from renewable energy sources in the internal electricity market (2000/0116(COD) – PE2)

PE 307.356

EN

EN

POSITION OF THE EUROPEAN PARLIAMENT

adopted at second reading on 4 July 2001

with a view to the adoption of European Parliament and Council Directive 2001/.../EC on the promotion of electricity produced from renewable energy sources in the internal electricity market

THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION,

Having regard to the Treaty establishing the European Community, and in particular Article 175(1) thereof,

Having regard to the proposal from the Commission[1].

Having regard to the Opinion of the Economic and Social Committee[2],

Having regard to the opinion of the Committee of the Regions[3],

Acting in accordance with the procedure laid down in Article 251 of the Treaty[4],

Whereas:

(1) The potential for the exploitation of renewable energy sources is underused in the Community at present. The Community recognises the need to promote renewable energy sources as a priority measure given that their exploitation contributes to environmental protection and sustainable development. In addition this can also create local employment, have a positive impact on social cohesion, contribute to security of supply and make it possible to meet Kyoto targets more quickly. It is therefore necessary to ensure that this potential is better exploited within the framework of the internal electricity market.

(2) The promotion of electricity produced from renewable energy sources is a high Community priority as outlined in the White Paper on Renewable Energy Sources (hereinafter referred to as "the White Paper") for reasons of security and diversification of energy supply, of environmental protection and of social and economic cohesion. That was endorsed by the Council in its Resolution of 8 June 1998 on renewable sources of energy [5], and by the European Parliament in its Resolution *of 18 June 1998* on the White Paper[6].

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1 OJ C 311 E, 31.10.2000, p. 320.
2 OJ C 367, 20.12.2000, p. 5.
3 OJ C 22, 24.1.2001, p. 27.
4 *Position* of the European Parliament of 16 November 2000 (not yet published in the Official Journal), Council Common Position of *23 March 2001* (*OJ C 142, 15.5.2001, p. 5*) and *Position* of the European Parliament of *4 July 2001*.
5 OJ C 198, 24.6.1998, p. 1.
6 *OJ C 210, 6.7.1998, p. 215.*

(3) The increased use of electricity produced from renewable energy sources constitutes an important part of the package of measures needed to comply with the Kyoto Protocol to the United Nations Framework Convention on Climate Change, and of any policy package to meet further commitments.

(4) The Council in its conclusions of 11 May 1999 and the European Parliament in its Resolution of 17 June 1998 on electricity from renewable energy sources [1] have invited the Commission to submit a concrete proposal for a Community framework on access for electricity produced from renewable energy sources to the internal market. Furthermore, the European Parliament in its Resolution of 30 March 2000 on *electricity* from renewable energy sources and the internal electricity market [2] underlined that binding and ambitious renewable energy targets at the national level are essential for obtaining results and achieving the Community targets.

(5) To ensure increased market penetration of electricity produced from renewable energy sources in the medium term, all Member States should be required to set national indicative targets for the consumption of electricity produced from renewable sources.

(6) These national indicative targets should be consistent with any national commitment made as part of the climate change commitments accepted by the Community under the Kyoto Protocol.

(7) The Commission should assess to what extent Member States have made progress towards achieving their national indicative targets, and to what extent the national indicative targets are consistent with the global indicative target of 12% of gross domestic energy consumption by 2010, considering that the White Paper's indicative target of 12% for the Community as a whole by 2010 provides useful guidance for increased efforts at Community level as well as in Member States, bearing in mind the need to reflect differing national circumstances. ***If necessary for the achievement of the targets, the Commission should submit proposals to the European Parliament and the Council which may include mandatory targets.***

1 OJ C 210, 6.7.1998, p. 143.
2 OJ C 378, 29.12.2000, p. 89.

(8) Where they use waste as an energy source, Member States must comply with current Community legislation on waste management. The application of this Directive is without prejudice to the definitions set out in Annex IIA and IIB of Council Directive 75/442/EEC of 15 July 1975 on waste[1]. ***Support for renewable energy sources should be consistent with other Community objectives, in particular respect for the waste treatment hierarchy. Therefore, the incineration of non-separated municipal waste should not be promoted under a future support system for renewable energy sources, if such promotion would undermine the hierarchy.*** *

(9) The definition of biomass used in this Directive does not prejudge the use of a different definition in national legislation, for purposes other than those set out in this Directive.

(10) This Directive does not require Member States to recognise the *obtention* of a guarantee of origin from other Member States or the corresponding purchase of electricity as a contribution to the fulfilment of a national quota obligation. *However, to* facilitate trade in electricity produced from renewable energy sources and to increase transparency for the consumer's choice between electricity produced from non-renewable and electricity produced from renewable energy sources, the guarantee of origin of such electricity is necessary. Schemes for the guarantee of origin do not by themselves imply a right to benefit from national support mechanisms established in different Member States. It is important that all forms of electricity produced from renewable energy sources are covered by such guarantees of origin.

(11) It is important to distinguish guarantees of origin clearly from exchangeable green certificates.

(12) The need for public support in favour of renewable energy sources is recognised in the Community guidelines for State aid for environmental protection [2], which, amongst other options, take account of the need to internalise external costs of electricity generation. However, the rules of the Treaty, and in particular Articles 87 and 88 thereof, will continue to apply to such public support.

(13) A legislative framework for the market in renewable energy sources needs to be established.

1 OJ L 194, 25.7.1975, p. 39. Directive as last amended by Commission Decision 96/350/EC (OJ L 135, 6.6.1996, p. 32).

2 OJ C 37, 3.2.2001, p. 3.

(14) Member States operate different mechanisms of support for renewable energy sources at the national level, including green certificates, investment aid, tax exemptions or reductions, tax refunds and direct price support schemes. One important means to achieve the aim of this Directive is to guarantee the proper functioning of these mechanisms, until a Community framework is put into operation, in order to maintain investor confidence.

(15) It is too early to decide on a Community-wide framework regarding support schemes, in view of the limited experience with national schemes and the current relatively low share of price supported electricity produced from renewable energy sources in the Community.

(16) It is however necessary to adapt, after a sufficient transitional period, support schemes to the developing internal electricity market. It is therefore appropriate that the Commission monitor the situation and present a report on experience gained with the application of national schemes. If necessary, the Commission should, in the light of the conclusions of this report, make a proposal for a Community framework with regard to support schemes for electricity produced from renewable energy sources. That proposal should contribute to the achievement of the national indicative targets, be compatible with the principles of the internal electricity market and take into account the characteristics of the different sources of renewable energy, together with the different technologies and geographical differences. It should also promote the use of renewable energy sources in an effective *way, be* simple and at the same time as efficient as possible, particularly in terms of *cost, include* sufficient transitional periods for national support systems of at least seven ***years, maintain*** investors' confidence and avoid stranded costs. This framework would enable electricity from renewable energy sources to compete with electricity produced from non-renewable energy sources and limit the cost to the consumer, while, in the medium term, reduce the need for public support.

(17) Increased market penetration of electricity produced from renewable energy sources will allow for economies of scale, thereby reducing costs.

(18) It is important to utilise the strength of the market forces and the internal market and make electricity produced from renewable energy sources competitive and attractive to European citizens.

(19) When favouring the development of a market for renewable energy sources, it is necessary to take into account the positive impact on regional and local development opportunities, export prospects, social cohesion and employment opportunities, especially as concerns small and medium-sized undertakings as well as independent power producers.

(20) The specific structure of the renewable energy sources sector should be taken into account, especially when reviewing the administrative procedures for obtaining permission to construct plants producing electricity from renewable energy sources.

(21) In certain circumstances it is not possible to ensure fully transmission and distribution of electricity produced from renewable energy sources without affecting the reliability and safety of the grid system and guarantees in this context may therefore include financial compensation.

(22) The costs of connecting new producers of electricity from renewable energy sources should be objective, transparent and non-discriminatory and due account should be taken of the benefit embedded generators bring to the grid.

(23) Since the general objectives of the proposed action cannot be sufficiently achieved by the Member States and can therefore, by reason of the scale or effects of the action, be better achieved at Community level, the Community may adopt measures, in accordance with the principle of subsidiarity as set out in Article 5 of the Treaty. Their detailed implementation should, however, be left to the Member States, thus allowing each Member State to choose the regime which corresponds best to its particular situation. In accordance with the principle of proportionality, as set out in that Article, this Directive does not go beyond what is necessary in order to achieve those objectives,

HAVE ADOPTED THIS DIRECTIVE:

Article 1

Purpose

The purpose of this Directive is to promote an increase in the contribution of renewable energy sources to electricity production in the internal market for electricity and to create a basis for a future Community framework *therefor*.

Article 2

Definitions

For the purposes of this Directive, the following definitions shall apply:

(a) "renewable energy sources" shall mean renewable non-fossil energy sources (wind, solar, geothermal, wave, tidal, hydropower, biomass, landfill gas, sewage treatment plant gas and biogases);

(b) "biomass" shall mean the biodegradable fraction of products, waste and residues from agriculture (including vegetal and animal substances), forestry and related industries, as well as the biodegradable fraction of industrial and municipal waste;

(c) "electricity produced from renewable energy sources" shall mean electricity produced by plants using only renewable energy sources, as well as the proportion of electricity produced from renewable energy sources in hybrid plants also using conventional energy sources and including renewable electricity used for filling storage systems, and excluding electricity produced as a result of storage systems;

(d) "consumption of electricity" shall mean national electricity production, including autoproduction, plus imports, minus exports (gross national electricity consumption).

In addition, the definitions in Directive 96/92/EC of the European Parliament and of the Council of 19 December 1996 concerning common rules for the internal market *in* electricity [1] shall apply.

Article 3

National indicative targets

1. Member States shall take appropriate steps to encourage greater consumption of electricity produced from renewable energy sources in conformity with the national indicative targets referred to in paragraph 2. These steps must be in proportion to the objective to be attained.

[1] OJ L 27, 30.1.1997, p. 20.

2. Not later than ..... * and every five years thereafter, Member States shall adopt and publish a report setting national indicative targets for future consumption of electricity produced from renewable energy sources in terms of a percentage of electricity consumption for the next 10 years. The report shall also outline the measures taken or planned, at national level, to achieve these national indicative targets. To set these targets until the year 2010, the Member States shall:

– take account of the reference values in the Annex;

– ensure that the targets are compatible with any national commitments accepted in the context of the climate change commitments accepted by the Community pursuant to the Kyoto Protocol to the United Nations Framework Convention on Climate Change.

3. Member States shall publish, for the first time not later than ..... ** and thereafter every two years, a report which includes an analysis of success in meeting the national indicative targets taking account, in particular, of climatic factors likely to affect the achievement of those targets and which indicates to what extent the measures taken are consistent with the national climate change commitment.

4. On the basis of the Member States' reports referred to in paragraphs 2 and 3, the Commission shall assess to what extent:

– Member States have made progress towards achieving their national indicative targets;

– the national indicative targets are consistent with the global indicative target of 12% of gross national energy consumption by 2010 and in particular with the 22,1% indicative share of electricity produced from renewable energy sources in total Community electricity consumption by 2010.

The Commission shall publish its conclusions in a report, for the first time not later than ..... *** and thereafter every two years. This report shall be accompanied, as appropriate, by proposals to the European Parliament and to the Council.

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* One year after the entry into force of this Directive.
** Two years after the entry into force of this Directive.
*** Three years after the entry into force of this Directive.

If the report concludes that the national indicative targets are likely to be inconsistent, for reasons that are unjustified and/or unrelated to new scientific evidence, with the global indicative target, the proposals shall address national targets, possibly including mandatory targets, in the appropriate form.

Article 4

Support schemes

1. Without prejudice to Articles 87 and 88 of the Treaty, the Commission shall evaluate the application of mechanisms used in Member States according to which a producer of electricity, on the basis of regulations issued by the public authorities, receives direct or indirect support, and which could have the effect of restricting trade, on the basis that these contribute to the objectives set out in Articles 6 and 174 of the Treaty.

2. The Commission shall, not later than ...*, present a well-documented report on experience gained with the application and coexistence of the different mechanisms referred to in paragraph 1. ***The report shall assess the success, including cost-effectiveness, of the support systems referred to in paragraph 1 in promoting the consumption of electricity produced from renewable energy sources in conformity with the national indicative targets referred to in Article 3(2).*** This report shall, if necessary, be accompanied by a proposal for a Community framework with regard to support schemes for electricity produced from renewable energy sources.

Any proposal for a framework should:

(a) contribute to the achievement of the national indicative targets;

(b) be compatible with the principles of the internal electricity market;

(c) take into account the characteristics of different sources of renewable energy, together with the different technologies, and geographical differences;

(d) promote the use of renewable energy sources in an effective way, and be simple and, at the same time, as efficient as possible, particularly in terms of cost;

* Four years after the entry into force of this Directive.

(e) include sufficient transitional periods ***for national support systems*** of at least seven years ***and*** maintain investor confidence

Article 5

Guarantee of origin of electricity produced from renewable energy sources

1. Member States shall, not later than ..... *, ensure that the origin of electricity produced from renewable energy sources can be guaranteed as such within the meaning of this Directive according to objective, transparent and non-discriminatory criteria laid down by each Member State. They shall ensure that a guarantee of origin is issued to this effect in response to a request.

2. Member States may designate one or more competent bodies, independent of generation and distribution activities, to supervise the issue of such guarantees of origin.

3. A guarantee of origin shall:

– specify the energy source from which the electricity was produced, specifying the dates and places of production, and in the case of hydroelectric installations, indicate the capacity;

– serve to enable producers of electricity from renewable energy sources to demonstrate that the electricity they sell is produced from renewable energy sources within the meaning of this Directive.

4. Such guarantees of origin, issued according to paragraph 2, should be mutually recognised by the Member States, exclusively as proof of the elements referred in paragraph 3. Any refusal to recognise a guarantee of origin as such proof, in particular for reasons relating to the prevention of fraud, must be based on objective, transparent and non-discriminatory criteria. In the event of refusal to recognise a guarantee of origin, the Commission may compel the refusing party to recognise it, particularly with regard to objective, transparent and non-discriminatory criteria on which such recognition is based.

5. Member States or the competent bodies shall put in place appropriate mechanisms to ensure that guarantees of origin are both accurate and reliable and they shall outline in the report referred to in Article 3(3) the measures taken to ensure the reliability of the guarantee system.

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* Two years after the entry into force of this Directive.

6. After having consulted the Member States, the Commission shall, in the report referred to in Article 8, consider the form and methods that Member States could follow in order to guarantee the origin of electricity produced from renewable energy sources. If necessary, the Commission shall propose to the European Parliament and the Council the adoption of common rules in this respect.

Article 6

Administrative procedures

1. Member States or the competent bodies appointed by the Member States shall evaluate the existing legislative and regulatory framework with regard to authorisation procedures or the other procedures laid down in Article 4 of Directive 96/92/EC, which are applicable to production plants for electricity produced from renewable energy sources, with a view to:

– reducing the regulatory and non-regulatory barriers to the increase in electricity production from renewable energy sources;

– streamlining and expediting procedures at the appropriate administrative level; and

– ensuring that the rules are objective, transparent and non-discriminatory, and take fully into account the particularities of the various renewable energy source technologies.

2. Member States shall publish, not later than ..... *, a report on the evaluation referred to in paragraph 1, indicating, where appropriate, the actions taken. The purpose of this report is to provide, where this is appropriate in the context of national legislation, an indication of the stage reached specifically in:

– coordination between the different administrative bodies as regards deadlines, reception and treatment of applications for authorisations;

– drawing up possible guidelines for the activities referred to in paragraph 1, and the feasibility of a fast-track planning procedure for producers of electricity from renewable energy sources; and

– the designation of authorities to act as mediators in disputes between authorities responsible for issuing authorisations and applicants for authorisations.

* Two years after the entry into force of this Directive.

3. The Commission shall, in the report referred to in Article 8 and on the basis of the Member States' reports referred to in paragraph 2 of this Article, assess best practices with a view to achieving the objectives referred to in paragraph 1.

Article 7

Grid system issues

1. Without prejudice to the maintenance of the reliability and safety of the ***grid, Member*** States shall take the necessary measures to ensure that transmission system operators and distribution system operators in their territory guarantee the transmission and distribution of electricity produced from renewable energy sources. They may also provide for priority access to the grid system of electricity produced from renewable energy sources. ***When dispatching generating installations, transmission system operators shall give priority to generating installations using renewable energy sources in so far as the operation of the national electricity system permits.***

2. Member States shall put into place a legal framework or require transmission system operators and distribution system operators to set up and publish their standard rules relating to the bearing of costs of technical adaptations, such as grid connections and grid reinforcements, which are necessary in order to integrate new producers feeding electricity produced from renewable energy sources into the interconnected grid.

These rules shall be based on objective, transparent and non-discriminatory criteria taking particular account of all the costs and benefits associated with the connection of these producers to the grid. The rules may provide for different types of connection.

3. Where appropriate, Member States may require transmission system operators and distribution system operators to bear, in full or in part, the costs referred to in paragraph 2.

4. Transmission system operators and distribution system operators shall be required to provide any new producer wishing to be connected with a comprehensive and detailed estimate of the costs associated with the connection. Member States may allow producers of electricity from renewable energy sources wishing to be connected to the grid to issue a call for tender for the connection work.

5. Member States shall put into place a legal framework or require transmission system operators and distribution system operators to set up and publish their standard rules relating to the sharing of costs of system installations, such as grid connections and reinforcements, between all producers benefiting from them.

The sharing shall be enforced by a mechanism based on objective, transparent and non-discriminatory criteria taking into account the benefits which initially and subsequently connected producers as well as transmission system operators and distribution system operators derive from the connections.

6. Member States shall ensure that the charging of transmission and distribution fees does not discriminate against electricity from renewable energy sources, including in particular electricity from renewable energy sources produced in peripheral regions, such as island regions and regions of low population density.

Where appropriate, Member States shall put in place a legal framework or require transmission system operators and distribution system operators to ensure that fees charged for the transmission and distribution of electricity from plants using renewable energy sources reflect realisable cost benefits resulting from the plant's connection to the network. Such cost benefits could arise from the direct use of the low-voltage grid.

7. Member States shall, in the report referred to in Article 6(2), also consider the measures to be taken to facilitate access to the grid system of electricity produced from renewable energy sources. That report shall examine, inter alia, the feasibility of introducing two-way metering.

Article 8

Summary report

On the basis of the reports by Member States pursuant to Article 3(3) and Article 6(2), the Commission shall present to the European Parliament and the Council, no later than 31 December 2005 and thereafter every five years, a summary report on the implementation of this Directive.

This report shall:

- consider the progress made in reflecting the external costs of ***electricity produced*** from ***non-***renewable energy sources and the impact of ***public support*** granted to electricity ***production;***

– take into account the possibility for Member States to meet the national indicative targets established in Article 3(2), the global indicative target referred to in Article 3(4) and the existence of discrimination between different energy sources.

If appropriate, the Commission shall submit with the report further proposals to the European Parliament and the Council.

Article 9

Transposition

Member States shall bring into force the laws, regulations and administrative provisions necessary to comply with this Directive not later than ..... *. They shall forthwith inform the Commission thereof.

When Member States adopt these measures, they shall contain a reference to this Directive or shall be accompanied by such a reference on the occasion of their official publication. The methods of making such reference shall be laid down by the Member States.

Article 10

Entry into force

This Directive shall enter into force on the day of its publication in the Official Journal of the European Communities.

* Two years after the entry into force of this Directive.

Article 11

Addressees

This Directive is addressed to the Member States.

Done at ,

For the European Parliament
The President

For the Council
The President

Reference values for Member States' national indicative targets for the contribution of electricity produced from renewable energy sources to gross electricity consumption by 2010 *

This Annex gives reference values for the fixing of national indicative targets for electricity produced from renewable energy sources ("RES-E"), as referred to in Article 3(2)

	RES-E TWh 1997 **	RES-E % 1997 ***	RES-E % 2010 ***
Belgium	0,86	1,1	6,0
Denmark	3,21	8,7	29,0
Germany	24,91	4,5	12,5
Greece	3,94	8,6	20,1
Spain	37,15	19,9	29,4
France	66,00	15,0	21,0
Ireland	0,84	3,6	13,2
Italy	46,46	16,0	25,0 [1]
Luxembourg	0,14	2,1	5,7 [2]
Netherlands	3,45	3,5	9,0
Austria	39,05	70,0	78,1 [3]
Portugal	14,30	38,5	39,0 [4]
Finland	19,03	24,7	31,5 [5]
Sweden	72,03	49,1	60,0 [6]
United Kingdom	7,04	1,7	10,0
Community	338,41	13.9%	22% ****

* In taking into account the reference values set out in this Annex, Member States make the necessary assumption that the State aid guidelines for environmental protection allow for the existence of national support schemes for the promotion of electricity produced from renewable energy sources.

** Data refer to the national production of RES-E in 1997.

*** The percentage contributions of RES-E in 1997 and 2010 are based on the national production of RES-E divided by the gross national electricity consumption. In the case of internal trade of RES-E (with recognised certification or origin registered) the calculation of these percentages will influence 2010 figures by Member State but not the Community total.

**** Rounded figure resulting from the reference values above.

1 Italy states that 22% would be a realistic figure, on the assumption that in 2010 gross national electricity consumption will be 340 TWh.
When taking into account the reference values set out in this Annex, Italy has assumed that gross national electricity production from renewable energy sources will attain up to 76 TWh in 2010. This figure includes the contribution of the *non-biodegradable* fraction of municipal and industrial waste used in compliance with Community legislation on waste management.
In this respect, the capability to reach the indicative target as referred to in this *Annex is* contingent, inter alia, upon the effective level of the national demand for electric energy in 2010.

2 Taking into account the indicative reference values set out in this Annex, Luxembourg takes the view that the objective set for 2010 can be achieved only if:

- total electricity consumption in 2010 does not exceed that of 1997;
- wind-generated electricity can be multiplied by a factor of 15;
- biogas-generated electricity can be multiplied by a factor of 208;
- electricity produced from the only municipal waste incinerator in Luxembourg, which in 1997 accounted for half the electricity produced from renewable energy sources, can be taken into account in its entirety;
- photovoltaically generated electricity can be raised to 80 GWh;
- and insofar as the above points can be achieved from the technical standpoint in the time allowed.

In the absence of natural resources, an additional increase in electricity generated by hydroelectric power stations is ruled out.

3 Austria states that 78.1% would be a realistic figure, on the assumption that in 2010 gross national electricity consumption will be 56,1 TWh. Due to the fact that the production of electricity from renewable sources is highly dependent on hydropower and therefore on the annual rainfall, the figures for 1997 and 2010 should be calculated on a long-range model based on hydrologic and climatic conditions.

4 Portugal, when taking into account the reference *values set* out in this Annex, states that to maintain the 1997 share of electricity produced from renewable sources as an indicative target for 2010 it was assumed that:

- it will be possible to continue the National Electricity Plan building new hydro capacity higher than 10MW;
- other renewable capacity, only possible with financial state aid, will increase at an annual rate eight times higher than has occurred recently.

These assumptions imply that new capacity for producing electricity from renewable sources, excluding large hydro, will increase at a rate twice as high as the rate of increase of gross national electricity consumption.

5 In the Finnish Action Plan for Renewable Energy Sources, objectives are set for the volume of renewable energy sources used in 2010. These objectives have been set on the basis of extensive background studies. The Action Plan was approved within the Government in October 1999.
According to the Finnish Action Plan, the share of electricity produced from renewable energy sources by 2010 would be 31%. This indicative target is very ambitious and its realisation would require extensive promotion measures in Finland.

6 When taking into account the reference *values set* out in this Annex, Sweden notes that the possibility of reaching the target is highly dependent upon climatic factors heavily affecting the level of hydropower production, in particular variations in pluviometry, timing of rainfall during the year and inflow. The electricity produced from hydropower can vary substantially. During extremely dry years production may amount to 51 TWh, whereas in wet years it could amount to 78 TWh. The figure for 1997 should thus be calculated with a long-range model based on scientific facts on hydrology and climatic change.
It is a generally applied method in countries with important shares of hydropower production to use water inflow statistics covering a time span of 30 to 60 years. Thus, according to the Swedish methodology and based on conditions during the period 1950-1999, correcting for differences in total hydropower production capacity and inflow over the years, average hydropower production amounts to 64 TWh which corresponds to a figure for 1997 of 46 percent, and in this context Sweden considers 52 percent to be a more realistic figure for 2010.
Furthermore, the ability of Sweden to achieve the target is limited by the fact that the remaining unexploited rivers are protected by law. Moreover, the ability of Sweden to reach the target is heavily contingent upon:

– the expansion of combined heat and power (CHP) depending on population density, demand for heat and technology development, in particular for black liquor gasification, and
– authorisation for wind power plants in accordance with national laws, public acceptance, technology development and expansion of grids.