Forests, products and people

Ireland's forest policy – a renewed vision

Department of
Agriculture,
Food and the Marine
An Roinn
Talmhaíochta,
Bia agus Mara

Forests, products and people

Ireland’s forest policy – a renewed vision

Comprising the final report and recommendations of the Forest Policy Review Group

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Acronyms and Abbreviations

AA	Appropriate Assessment (procedure)
AAC	Annual Allowable Cut
AEOS	Agri-Environment Options Scheme
BHF	Broadleaved High Forest
C+I	Criteria and Indicators
CA	Competent Authority
CAP	Common Agricultural Policy
CBA	Cost Benefit Analysis
CCF	Continuous Cover Forestry (system)
CEN	Comité Européen de Normalisation
CHP	Combined Heat and Power
CIS	Commonwealth of Independent States
COFORD	Council for Forest Research and Development
CPI	Consumer Price Index
CPP	Coillte Panel Products
DAFF	Department of Agriculture, Food and Fisheries (now DAFM)
DAFM	Department of Agriculture, Food and the Marine
DAHG	Department of Arts, Heritage and the Gaeltacht
DG	Directorate General
DoECLG	Department of the Environment, Community and Local Government
DSS	Decision Support Systems
ECX	European Climate Exchange
EEC	European Economic Community
EFSOS	European Forest Sector Outlook Study
EIA	Environmental Impact Assessment
EPA	Environmental Protection Agency
EU	European Union
FAO	Food and Agriculture Organisation (of the United Nations)
FEPS	Forest Environment Protection Scheme
FETAC	Further Education and Training Awards Council
FIPS	Forest Information and Planning System
FMP	Forest Management Plans
FOP	Forestry Operational Programme
FPRG	Forest Policy Review Group
FSC	Forest Stewardship Council
FSPAC	Farm Safety Partnership Advisory Committee
FTE	Full-Time Equivalent
FTEI	Forestry Training and Education in Ireland
GMIT	Galway Mayo Institute of Technology
GPC	Grant and Premium Category
HSA	Health and Safety Authority
IAS	Invasive Alien Species

IBEC	Irish Business and Employers Confederation
IFA	Irish Farmers Association
iFORIS	Integrated Forest Information Internet System
IForUT	Irish Forestry Unit Trust
IFFPA	Irish Forestry and Forest Products Association
IFS	Indicative Forest Statement
ITGA	Irish Timber Growers Association
LISS	Low Impact Silvicultural System
LULUCF	Land-use, Land-use Change and Forestry
MCPFE	Ministerial Conference on the Protection of Forests in Europe
MDF	Medium Density Fibreboard
MO	Monitoring Organisation
NDMU	National Deer Management Unit
NFI	National Forest Inventory
NGO	Non-Governmental Organisation
NHA	National Heritage Area
NPWS	National Parks and Wildlife Service
NSAI	National Standards Authority of Ireland
OPC	Office of the Parliamentary Counsel
OSB	Orientated Strand Board
PCRW	Post Consumer Recovered Wood
PEFC	Programme for the Endorsement of Forest Certification
PR	Public Relations
PRP	Priority Roads Programme
R&D	Research and Development
REFIT	Renewable Energy Feed-in Tariff
RBD	River Basin District
RDP	Rural Development Programme
REPS	Rural Environment Protection Scheme
ROI	Republic of Ireland
SAC	Special Area of Conservation
SEAI	Sustainable Energy Authority of Ireland
SFM	Sustainable Forest Management
SIF	Society of Irish Foresters
SPA	Specially Protected Areas
TIDG	Timber Industry Development Group
UCD	University College Dublin
UNECE	United Nations Economic Commission for Europe
UNFCCC	United Nations Framework Convention on Climate Change
WFD	Water Framework Directive
WFQA	Wood Fuel Quality Assurance
WIT	Waterford Institute of Technology
WBP	Wood Based Panels
WTP	Willingness To Pay

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(Photo: K.Collins)

Foreword

I am very pleased to welcome ***Forests, products and people – Ireland's forest policy – a renewed vision.*** This important renewed policy sets out an updated national forest policy strategy which is fit for purpose, reflects and takes account of the substantial changes that have occurred in Irish forestry since the publication of its forerunner Growing for the Future in 1996; and which will steer and guide the expansion of the forest sector out to 2046 in a sustainable and cost efficient manner.

The Terms of Reference of the Forest Policy Review Group were to review and update national forest policy goals; I am satisfied that these have been addressed in a comprehensive and balanced way.

The new strategy has been developed over the past three years by my Department. The formulation and evaluation process has been comprehensive and inclusive, with the result that ***Forests, products and people – Ireland's forest policy – a renewed vision***, reflects the inputs from the Forest Policy Review Group, and those other stakeholders who made submissions at the different stages of the process.

A number of innovative recommendations have emerged for my consideration.

Not least of these is the establishment of a Forest Council, which will track the implementation of the recommendations in the policy review, and provide a structure for stakeholder input.

I will be giving this and the other important recommendations my full consideration in the months ahead.

Finally, I wish to express my deep gratitude to the Forest Policy Review Group representatives and indeed to all other stakeholders who have contributed to the development of this new national forest policy.

Tom Hayes T.D.
Minister of State for Forestry
Department of Agriculture, Food and the Marine

Summary

Forests Products and People – strategic goal and main recommendations

The overall strategic goal in 1996 was *to develop forestry to a scale and in a manner which maximises its economic contribution to national economic and social well-being on a sustainable basis and which is compatible with the protection of the environment*.

Much has happened in the interim including

- Major investment in wood processing and the increasing levels of export of wood products to existing and new markets;
- The development of an export orientated wood panel industry;
- More recently the emergence of the wood energy sub-sector which will assume increasing importance over the coming decade;
- Increased understanding and recognition of the impacts of afforestation and forest management on water quality, biodiversity and ecosystems services, including climate change mitigation;
- The increased use of forests for recreation and leisure; and
- Emergence of supply from the private sector

The strategic goal can now be stated as:

To develop an internationally competitive and sustainable forest sector that provides a full range of economic, environmental and social benefits to society and which accords with the Forest Europe definition of sustainable forest management [1].

Forestry is playing an increasingly important economic, environmental and social role. The forest industry, comprising the growing, harvesting and processing of forest products makes a significant and increasing contribution to the Irish economy. In 2010, the total value to the economy of the forestry growing sector was €673 million, while the overall forestry sector contributed an estimated €2.2 billion (FORECON 2011).

Forests now account for 10.8% of the land area of the country and support a vibrant, export-oriented forest products sector with over 80% of wood based panels being exported. Harvest from Irish forests was 2.88 million cubic metres in 2010 (COFORD 2011). With increasing reliance on the export market, the importance of investment in innovation, research and development and added value cannot be overstated. The industry must continually strive to increase its competitiveness in what is a global market for timber and timber products. Efficiencies along the supply chain must be examined and cost saving/control measures introduced. The combination of innovation and added value, coupled with an efficient and competitive supply chain will enhance the industry's wood paying capability thereby leveraging increased supplies especially from the private sector.

Ireland, with growth rates of certain species more than double those achievable in some European countries, has a strong comparative advantage in the growing of wood fibre. It is vitally important that future afforestation harnesses this advantage through the use of suitable reproductive material, appropriate species choice and suitable site types. Such an approach will contribute to the sustainability of raw material supply and enhancement of carbon sequestration and towards ensuring sustainable supplies of renewable energy in line with the legally-binding 16% renewable energy 2020 target under the EU Renewable Energy Directive.

Forestry plays an increasingly important role in rural development not only through the diversification of farm income but also through the provision of rurally based employment both of which contribute to rural stabilisation and viability. In 2010 the total employment supported by the forest sector was estimated to be 12,000 with the majority of jobs rurally based (FORECON 2011). The policy builds on this - reaching the 15,000 ha per year level of afforestation would result in the creation of an estimated further 490 jobs in planting, managing, harvesting and processing (Ní Dhubháin et al. 2006). By the end of the afforestation programme outlined here, the level of rural employment provided by forestry will have more than doubled.

Forest owners and the wood industry face challenging times in a globally competitive market. If the State's support to forestry is to deliver on its objectives around climate change, employment, economic development

[1] Forest Europe (The Ministerial Conference on the Protection of Forest in Europe) is the pan-European political process for the sustainable management of the continent's forests and defined SFM (Helsinki 1993) as *the stewardship and use of forests and forest lands in a way, and at a rate, that maintains their biodiversity, productivity, regeneration capacity, vitality and their potential to fulfil, now and in the future, relevant ecological, economic and social functions, at local, national, and global levels, and that does not cause damage to other ecosystems.*

and renewable energy, then all elements of the forest sector and regulatory bodies must work together. This will involve full and transparent co-operation regarding envisaged regulatory/legal changes that impact on forests and the environment. As outlined in the Oslo Ministerial Decision: European Forests 2020 (Ministerial Conference on the Protection of Forests in Europe 2011), the State, in collaboration with the forest sector, faces the challenge of monetising the environmental and social benefits that forestry provides.

Overall, this renewed forest policy reflects the Oslo Decision and the vision it contains for Europe's forests:

> *To shape a future where all European forests are vital, productive and multifunctional. Where forests contribute effectively to sustainable development, through ensuring human well-being, a healthy environment and economic development in Europe and across the globe. Where the forests' unique potential to support a green economy, livelihoods, climate change mitigation, biodiversity conservation, enhancing water quality and combating desertification is realised to the benefit of society.*

The vision reflects changes in human attitudes due to changes in socio-economic and environmental circumstances which have resulted in a progression in society's expectations of forests from mainly providing market goods towards the provision of more environmental goods (Wang et al. 2007). The essence of the changes lies in the expression of the public's understanding and interest in the multiple benefits that forests can provide and in particular the range of environmental and social services, focusing on biodiversity, water quality, landscape, recreation and leisure, climate change mitigation and renewable energy. To deliver on these services will require the wise management of existing resources and careful planning of future afforestation.

Forests' contribution to climate change mitigation through carbon sequestration forms an important element of the national climate change strategy. It is estimated that Irish Kyoto-eligible forests will sequester about 4.8 million tonnes of carbon dioxide (CO_2) in 2020, representing between 40% and 60% of distance to target (depending on the emission scenario used and the final nature of targets to 2020). The afforestation policy outlined in this document will not only support Ireland's efforts to reach the demanding greenhouse gas emission reduction targets (which are anticipated to rise to 80% of the 1990 level by 2050) but will also reduce dependence on fossil fuels and support the transition to a low carbon economy.

Summary of the Recommended Policy and Actions

Expansion of the Forest Resource - ***To increase the forest area, in accordance with sustainable forest management (SFM) principles, in order to support a long term sustainable roundwood supply of 7 to 8 million cubic metres per annum.***

The main focus is to increase the level of annual afforestation to 15,000 ha. The planned level of afforestation will ensure a sustainable level of future timber supply for the wood processing and wood energy sectors. Species choice will need to take account not only the implications of climate change but will also need to be aligned with future market requirements and carbon sequestration capacity. All afforestation will comply with updated environmental and regulatory procedures (see Environment and Public Goods). Support for afforestation will be primarily within the context of agricultural support schemes aimed at the most efficient use of natural resources.

Management of the Resource - ***To ensure the sustainable management of the forest resource in accordance with best practice thereby ensuring its capacity to provide the full range of timber and other benefits.***

The main focus is the optimum management of the resource. A new and comprehensive scheme for the preparation and collation of forest management plans will be introduced by the Department of Agriculture, Food and the Marine (DAFM) following consultation with stakeholders. The scheme will support sustainable forest management (SFM), facilitate certification, the forecasting of future roundwood supply, felling compliance and public good functions. The new system will include submission, updating, review and analysis into iFORIS (integrated forest information system). The current mechanisms of informing the forest sector and in particular forest owners will be reviewed, and where appropriate new and more effective initiatives and measures will be put in place. To leverage supplies from the private sector to meet the increasing demand for wood energy, two consecutive five year priority roading programmes will be supported.

Environment and Public Goods - ***To ensure that afforestation, management of existing forests and development of the forest sector are undertaken in a manner that ensures compliance with environmental requirements and objectives and enhances their contribution to the environment and their capacity for the provision of public goods and services.***

In line with increasing knowledge of the impact of forestry on the environment and on the changing regulatory framework, all environmental guidelines will be updated. DAFM, in collaboration with the Department of Environment, Community and Local Government) DoECLG, the National Parks and Wildlife Service (NPWS) and statutory bodies will bring together under a single protocol all legal compliance and best practice guidance for forestry. A better understanding of the value of non-timber benefits will be fostered through continued research and information dissemination by DAFM and these should be taken into account in any economic appraisal of forestry at the national level. All proposed European Union (EU) regulations, EU Directives and national legislation should be subject to full stakeholder consultation and Regulatory Impact Assessment (RIA).

Supply Chain - ***To further develop an efficient, sustainable and environmentally responsible supply chain that is compatible with forecast volumes, which will enhance the competitiveness of the processing sector and its wood paying capacity to forest owners.***

DAFM, in partnership with grower representative organisations, Coillte and the forest industry, will facilitate the development of National Roundwood Mobilisation Strategy in light of best international practice and to facilitate measures to implement efficiency measures and logistics along the supply chain. Closely aligned to this is the development of a framework to allow the shared use of forest roads for forest operations. Concerns regarding harvesting infrastructure will be addressed through identifying current capacity and future requirements.

Wood Processing - ***To support the development of a competitive, innovative, value-added and market focused wood processing sector which provides sustainable solutions to a diverse portfolio of users in the construction, lifestyle, renewable energy, furniture and related markets.***

DAFM will facilitate a review of the wood processing and wood based panels sector with a view to improving long term sustainable roundwood supply from both the private sector and Coillte and identifying areas where collaboration can contribute to realising increased levels of supply from the private sector. This is in addition to initiatives around harvesting and infrastructure development to leverage roundwood from the private sector as for example training and the priority forest roads programme. State agencies will support initiatives to add value to the current range of timber products being processed and to the development of new and innovative products.

Forest Protection and Health - ***To maintain a healthy forest environment through sustainable forest management and early detection and control measures to prevent the introduction and spread of harmful invasive alien species, pests and diseases.***

The problem of deer will be addressed by a full-time National Deer Management Unit within DAFM which will, in association with relevant stakeholders, coordinate deer management policy development and implementation. The Forest Protection Guidelines and Forestry Schemes Manual will be updated in light of new and emerging threats to forests. DAFM in collaboration with the Local Authorities and relevant stakeholders will put in place guidance which will facilitate a co-ordinated system of fire plans for forest plantations and implement the recommendations of the Land and Forest Fires Working Group. DAFM and the Forest Service will continue to identify pest risks and maintain biosecurity and phytosanitary measures addressing pests, diseases and invasive alien species.

Education Training and Research - ***To ensure the availability of suitable programmes of education and training across the sector and research programmes targeted at identified needs.***

The importance of investment in training, research and development is recognised and the strategic actions focus on a more co-ordinated overall approach in these important areas.

Quality, Standards and Certification - ***Forest products, forest services and the management of the forest resource will have a strong, market-led, quality focus.***

DAFM will facilitate voluntary forest certification through the structure and content of environmental guidelines, an updated *Code of Best Forest Practice* and forest management planning systems, and through other measures, in order to facilitate access to market.

Policy Implementation and Review - ***Policy will be implemented through ongoing monitoring and reporting of progress in consultation with stakeholders, and the policy will be updated to meet changing needs and circumstances.***

Establish a Forest Council, representative of the forest and related sectors, with a permanent secretariat and three subordinate committees (a) research and sectoral development, (b) schemes and measures and (c) environment, which would have the responsibility for ongoing monitoring and reporting of progress on policy implementation against agreed indicators of achievement and advice on updating of policy and or strategic measures.

Funding - ***To support the development of the forest sector through a combination of funding and fiscal arrangements including joint EU funding, direct State funding and facilitating private investment.***

The tax treatment of forestry will be to ensure that it does not act as a disincentive for the achievement of national policy goals in particular forest cover, roundwood supply to industry and climate change mitigation. DAFM will explore financial and funding mechanisms to encourage greater level of institutional investment in afforestation and in mobilising wood supply from the existing private forest estate. DAFM and the Forest Service to work with Coillte and other bodies to explore the viability and cost of a national carbon based afforestation scheme.

Legislation - ***To ensure that forest related legislation is relevant to the needs of the sector and underpins the principles of sustainable forest management while recognising the multifunctional nature of forestry.***

To ensure that the Forestry Bill includes provision for forest management planning and for streamlined permitting procedures for the undertaking of forest operations including thinning, clearfelling and other regenerative fellings.

State Forest Enterprise - Coillte - Coillte, in common with other State enterprises, is the subject of a separate Government policy examination. In light of this development, the Coillte review undertaken in 2010 was not made available to this Forest Policy Review Group (FPRG) and accordingly the FPRG is not in a position to make specific recommendations in relation to Coillte. Where relevant, recommendations of this review are applicable to Coillte as well as to private woodland owners.

A Government decision in relation to the proposed sale of Coillte Harvesting Rights, announced in June 2013, states: *at its meeting today, the Government decided that now is not the appropriate time to proceed with the sale of harvesting rights in Coillte and that the current focus must be on the restructuring of Coillte, overseen by NewERA and the relevant stakeholder Department*.

Institutional Arrangements - ***To support the development of the Forest Service as an efficient delivery service organisation meeting the needs of Government, national forest policy and the forest sector.***

In line with the global shift in emphasis across State forest authorities from that of being a "permitting" authority to that of being a service provider with defined customer segments, the Forest Service will undergo a functional and efficiency review in light of existing and future policy needs. The Forest Service will also re-instate an Annual Report, providing a review of achievement versus specific goals in areas such as afforestation, timber production and climate mitigation while also providing a statistical database for reporting and planning.

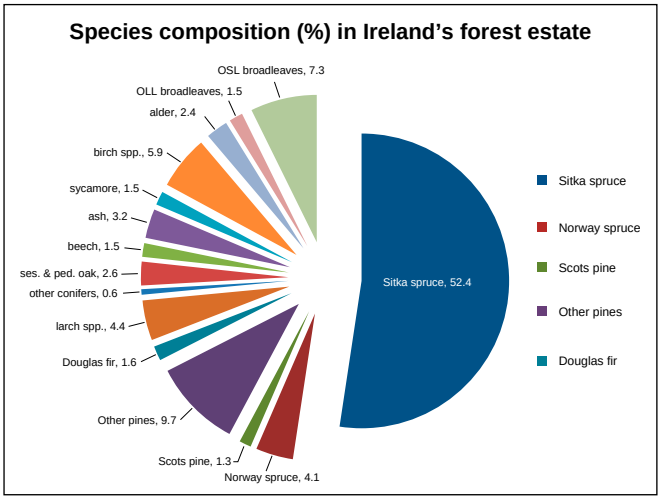
Sectoral Development - ***To set up a Task Force to*** *consider the establishment of a stand-alone government body or agency which could have the responsibility of addressing the developmental and promotional issues of the forest sector***.**

Establish a Task Force to consider the establishment of a stand-alone government body or agency which could have the responsibility of addressing the development and promotion of the forest sector and forest products nationally and internationally. The Task Force would report to DAFM through the Forest Council.

Irish Forestry Today

Forest Sector

The forest sector is relatively young but is increasingly important in the national economy and has a vital role to play in the context of rural development. Over the past decade the importance of wood processing as a component of the sector has greatly increased, as levels of roundwood output have grown and the return on State and private investment in afforestation and related areas becomes more tangible. This trend will continue as the scope of forest policy broadens, with increasing attention being paid to competitiveness in the growing and processing forest products, and to Ireland's comparative advantage in growing wood.



The national forest estate has increased from a modest 89,000 hectares (ha) in 1928[2] to 731,650 ha by the end of 2012, an area which represents 10.5% of the land of the country (Redmond 2013). Approximately 46% is privately owned while the remaining 54% is publicly-owned, primarily by Coillte Teoranta. Up to the 1980s almost all afforestation was undertaken by the State. It was not until the introduction of the State/EU funded forestry grant and annual payment / premium schemes that private landowners, mainly farmers, began to plant significant amounts of forest.

Non-native species represent 76.2% of the forest area, native species 23.8%. The total growing stock is estimated as 70 million cubic metres, with 74% being in publicly-owned forests. The average growing stock is 112 cubic metres per ha, which is low in comparison with many European countries (Ministerial Conference on the Protection of Forests in Europe 2007) and is a reflection of the young age structure of the forest estate with 65% of forests still in the first rotation.

Roundwood Production - Roundwood production from Irish forests is forecast to double from 3.2 million cubic metres in 2010 to 6.4 million cubic metres by 2028 with almost all of the increase expected to come from the private sector (COFORD 2011). This increase in volume production reflects the relatively young age of privately owned forests with over 237,000 ha being planted within the past twenty years. Although the National Forest Inventory (Forest Service, 2008) found that broadleaves represented 25% of the forest estate, spruce species are estimated to comprise 83% of the forecast total volume production over the next two decades, with pines contributing some 10%, and the remaining 7% coming from other conifer species and broadleaves.

Employment - Bacon (2004) estimated that the total employment that is directly engaged in growing and using forest products or is engaged in related sectors was 16,175. More recently, a study completed on behalf COFORD in 2006 (Ní Dhubháin et al. 2006) concluded that for every 100 jobs in the forestry sub-sector, another 90 full-time equivalent jobs are provided within the economy, giving a multiplier effect of 1.9. In 2010, direct employment in the forest sector was 7,032. Accounting for the induced and indirect effects, the total employment supported by the forest sector was estimated to be circa 12,000 (FORECON 2011).

Contribution to the national economy - The forest industry, comprising growing, harvesting and processing of forest products makes a significant and increasing contribution to the Irish economy. In 2010, direct output in the forestry sector (excluding the processing sector) was €378 million and when the indirect and induced effects are taken into account this increases to €673.0 million. The total value to the economy of the overall forestry sector was €2.20 billion (FORECON 2011).

Forest Industry and Markets - The sawmilling sector encompasses a large number of relatively small sawmills and a small number of medium to large sized mills. An estimated 75% of all volume is processed by the five largest sawmills (Magner, 2004). The sector supplies approximately 55% of the home sawn wood market (Knaggs and O'Driscoll, 2012a). However, due to the downturn in the Irish housing and construction sector, sawmills have had

[2] Minister for Lands and Agriculture , Dáil Éireann, Volume 23, 3rd May, 1928

to find new markets for their sawnwood products. In 2009, Ireland was the fourth largest supplier of sawn softwood to the UK (O'Driscoll 2010).

There are three panel manufacturing mills in the republic of Ireland (ROI), the two largest of which (Smart*Ply* and Medite) are now owned by Coillte. Since 2007, the trend (in value terms) has been for Ireland to become a net exporter of sawn timber, largely due to the collapse of the domestic construction market and increased levels of exports to the UK. In 2011, sawmills processed 1.7 million cubic metres of roundwood, generating 0.76 million cubic metres of sawn timber. While the domestic sawn timber market declined by 53% over the period 2008-2011, sawn timber exports grew by 60% (Knaggs and O'Driscoll, 2012a).

In 2011, exports of forest products were valued at €308 million, unchanged on 2010. Wood based panels accounted for €173 million. The balance comprised paper and sawn timber exports. In 2010 Ireland became a net exporter of sawn timber in value terms for the first time since statistics were compiled since 1961. In 2011, 763,000 cubic metres of wood based panels (WBP) was produced from 1.34 million cubic metres of wood fibre with 84% or 616,000 cubic metres of WBP being exported (Knaggs and O'Driscoll, 2012a).

Energy - After wind energy, wood fuels are the largest contributor to renewable energy generation in Ireland – contributing about 4.7 PJ[3] annually to energy use. The largest single use of wood for energy is within the forest products sector itself. There are three commercial wood fuelled biomass combined heat and power (CHP) plants in Ireland with a combined installed capacity of 7.7 MWe[4] (Phillips 2011). D Pellet Ltd, the first pellet plant in the Republic of Ireland commenced production in 2008 and a second plant operated by Laois Sawmills Ltd began production in 2009. Wood biomass use over the period 2008-2011 has increased by 37.4%, including wood chip and wood pellets for heating (Knaggs and O'Driscoll 2012a).

Environment and Public Goods

Environment - Forestry contributes much to the health and diversity of Ireland's natural environment. Irish forest management practices have impacts on water quality, habitats and ecosystems. Greater diversity of forest resources and forest management models, combined with improved environmental protection measures throughout forest planning and management cycles, can contribute to national, EU and international environmental objectives and obligations.

Climate Change – Forests mitigate climate change through sequestration of carbon by tree growth and carbon storage in soils, tree stems, roots and ground litter. Forests can also assist adaptation to climate change through, for example, flood alleviation associated with some alluvial woodland types. The extent to which forests mitigate climate change depends on the type of forest, site and management. The removal of carbon dioxide from the atmosphere by Ireland's forests exceeds 6 million tonnes per annum, or 3.6 million tonnes net of carbon dioxide removed in roundwood harvest (Hendrick and Black, 2009). This is equivalent to almost 6% of total greenhouse gas (GHG) emissions. Kyoto forests – those established since 1990 – will sequester 11 million tonnes of carbon dioxide over the five-year period to the end of 2012, which based on an average price of €20 per tonne of carbon dioxide will have an estimated value to the exchequer of €220 million (Hendrick and Black, 2009). In addition, wood fuel use replaced fossil fuel derived carbon dioxide emissions of 0.4 million tonnes in 2008 and this is expected to increase significantly in coming years as more roundwood volume becomes available from the private sector. The European Forest Institute (EFI, 2011) predict that climate change will result in increased frequency of storms, drought occurrences and insect and pathogen outbreaks in forests across Europe and advocates that forest policies support adaptive forest management to combat these threats.

CLIMADAPT, a new tool to aid species selection, taking into account likely changes in the Irish climate has been developed under the National Forestry Research Programme. It has a role to play in guiding species choice and related management decisions (available at http://82.165.27.141/climadapt_client/index.jsp).

Biodiversity - Biodiversity describes the variability among living organisms and the ecosystems of which they are part. Forestry plantations can make a significant positive contribution to biodiversity in the landscape when properly planned and managed, but can impact negatively in the absence of good management practices (BioForest Report, EPA, 2006). The level of implementation of the BioForest report recommendations should be assessed by the environment group proposed as part of the establishment of a Forest Council. Biodiversity benefit from the existing forest estate was valued at €5.6 million per annum over the best alternative land use (assumed to be Rural Environmental Protection Scheme (REPS)), but with the potential to increase by €1.6 million per annum under the

[3] Peta joules
[4] Megawatts of electricity

planned afforestation targets(Bacon 2004). This may be an underestimate in light of preliminary findings of a study commissioned by Coillte and the Heritage Council which has yet to be published.

Water quality and hydrology– Forests can play an important positive role in the maintenance and enhancement of water quality, but can also impact negatively in the absence of good management practices. The costs and benefits of forestry on water supply and quality have not been measured for Ireland. Updated environmental guidelines, due to be introduced in 2014, will facilitate the implementation of the Water Framework Directive (WFD).

Recreation - Forests provide the venue for a wide variety of outdoor recreational activities. The monetary value of the recreational use of forests and trails has been examined in a number of recent studies. Bacon (2004) estimated the annual recreational value of forestry as being of the order of €79 million based on an annual estimated 11 million[5] forest visits. Fitzpatrick and Associates (2005) in their analysis of the Coillte estate estimated that annual visits were 18 million[6] and provided a non-market value of €97 million annually. The total economic activity generated by domestic forest users is estimated at €268 million. Walking tourism, generally by overseas visitors, accounts for €138 million per annum.

Forest Policy

Early Years - Ireland's forest policy has undergone a number of significant changes in emphasis since the founding of the State when forest cover represented approximately 1% of the land area. In the early years, the focus was on developing a strategic supply of home-grown timber with the proviso that afforestation did not compete with agriculture for land. As time progressed, the emphasis changed to include a social and employment dimension. The first Programme for Economic Recovery in 1959 and the second in 1964 confirmed the State planting of 25,000 acres (10,000 ha) per annum with a target of 1 million acres (400,000 ha), the social dimension around rural employment particularly in the western half of the country and the strategic aim of self sufficiency in timber. The 1 million acre target was reached in 1993. The policy of non competition with agriculture, reflected in a cap on the price payable by the State for land, together with technical advances in cultivation and nutrition saw the wide spread planting of peat soils during this period.

The European Conservation Year (1970) saw the introduction of policy initiatives to conserve habitats and wildlife and to encourage public recreation in forests. The Wildlife Act of 1977 provided a legal framework for conservation and led to the creation of the first woodland nature reserves in the country. Ireland's entry to the EU in 1973 was marked by a downturn in afforestation as land prices soared and agriculture experienced a boom period.

Support for Private Planting - The introduction of the Western Package Scheme supported by EU Funding in 1981 saw the first of many initiatives to support afforestation by the private sector and in particular by farmers. The scheme had limited success. A review in 1985 highlighted the lack of annual income as being one of a number of reasons. In 1987 a scheme of compensatory allowances was introduced which provided annual payments for fifteen years and was amended the following year to increase the annual payment period to twenty years for broadleaves. The current premium scheme with payments of twenty years for farmers was introduced in 1993.

State Ownership Role - In 1989 the State's ownership role in relation to forests was transferred from the then Forest and Wildlife Service to Coillte Teoranta (The Irish Forestry Board Limited), which was established under the 1988 Forestry Act with a mandate *to carry on the business of forestry and related activities on a commercial basis and in accordance with efficient silvicultural practices.* The general duties of the company include *to have due regard to the environmental and amenity consequences of its operations*" and the Act allows for the *sale and acquisition of land and the sale of timber*.

Support Measures - The Forestry Operational Programme (FOP) 1989-93 continued to support afforestation with increasing emphasis on the planting of better land and broadleaves. The FOP also addressed the improvement and reconstitution of woodlands, road construction and harvesting. The Operational Programme for Rural Development (1989-93) included measures to support recreation, nurseries, back up Farm Forestry Services (ICOS, Teagasc) and training.

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[5] Based on 8.5 million visits from Clinch (1999) using 1995 data and a growth rate in numbers of 3% per annum during the intervening period. A willingness to pay per visit was estimated as €3.34 per person using 2003 prices.

[6] Based on an adult population of 3 million and six visits annually as was found in the Great Britain Day Survey of 6,600 people. A value of €5.40 per visit was used based on survey data.

Legislation – A range of national and EU legislation has impacted on forest policy over the past two decades including the Planning and Development Acts, Safety Health and Welfare at Work Regulations, Wildlife Acts and the transposition and implementation of the Habitats, Birds, EIA and Water Framework Directives. The main legislative instruments are listed in Chapter 11.

Recent Changes in Policy - In 1996, the Government published *Growing for the Future*, an ambitious strategy for the development of the forestry sector in Ireland to 2035. Bacon (2004) noted that the new policy was formulated in the context of increasing awareness of the environmental and social values of forestry, a decreasing ownership role of the State throughout Europe and developing regional and global regulatory frameworks for forestry. Against this background and recognising Ireland's low forest area and ongoing reforms within the agricultural sector, the main objective was defined as:

> *To develop forestry to a scale and in a manner which maximises its contribution to national economic and social well being on a sustainable basis and which is compatible with the protection of the environment.*

The report concluded that, in order to reach a scale of timber production large enough to support a range of processing industries, the national forest estate would need to increase to 1.2 million ha (17% of total land area) by 2030. It aimed to achieve this by increasing afforestation levels to 25,000 ha per annum to year 2000 and 20,000 ha per annum thereafter from 2001 to 2030. Other goals included:

- Market development, particularly for small diameter roundwood (e.g. energy);
- Ensure appropriate management of the existing forest resource;
- Improve supply chain efficiencies in the farm forestry sector; and
- Investment in research and development.

In 1999 the Heritage Council published a 'Policy Paper on Forestry and the National Heritage' which addressed a broad range of issues around species, biological diversity, water, archaeology, landscape and legislation (Heritage Council, 1999). It proposed to increase broadleaf planting to 50% but did not explore the funding or timber supply implications of this recommendation. The National Biodiversity Plan (2002) proposed a target of 30% broadleaf planting in afforestation by 2007, called for the introduction of a Native Woodland Scheme and the preparation of an Indicative Forest Strategy approach, incorporating FIPS[7], geographic information systems (GIS) and the Forests Soils Project, to have the 'right tree in the right place' and other policy measures to better align the performance of the forestry sector with biodiversity targets.

Food Harvest 2020 (DAFF 2010) presents a strategy for the medium-term development of the agri-food (including drinks) sector and an outline strategy for the fisheries and forestry sectors for the period to 2020. It includes key actions to ensure that the sector contributes to the maximum extent to export-led economic recovery and the full development of the smart economy. The recommendations for forestry focus on (a) competitiveness, (b) environmental issues and (c) research and development (Appendix 1).

Industry Development - The Timber Industry Development Group (TIDG) was established by Government in 2000 with a remit to make recommendations on the optimum development of the industry sectors which process and market Irish timber and non-timber forest products. The group reported in 2001 and made a series of recommendations on (a) supply chain management, (b) research and development, (c) residues and pulpwood and (d) marketing. Key to the recommendations was the establishment of a Chief Executive's Strategic Forum. The report was not adopted by Government.

Review of *Growing for the Future*

Many of the targets and strategic action within *Growing for the Future* have been achieved, although Bacon (2004) drew attention to the failure to achieve several of the fundamental targets including:

- The annual afforestation targets;
- The ratio of public to private afforestation; and
- The achievement of adequate improvement in the compatibility of the forestry programme with other farm supports.

[7] Forest Information and Planning System (FIPS) completed in 1998 classified forest cover by broad forest type through a combination of ortho-photography interpretation and ground validation.

Afforestation - The original targets foresaw a continuation of State planting of the order of 30% but with the largest share of afforestation being undertaken by the private sector with emphasis on farm forestry. Progress towards the achievement of 17% forest cover by 2030 has been challenging. At the end of 2009, 161,000 ha had been planted. However afforestation averaged only 53% of target with a cumulative shortfall of 143,952 ha (Figure 1).

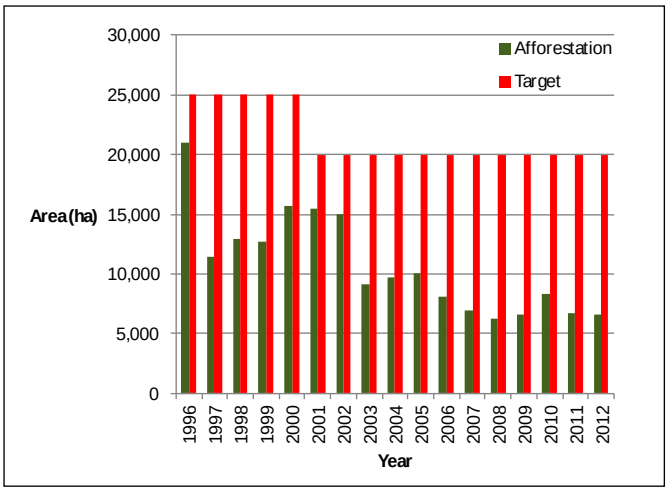

Figure 1: Afforestation v Target 1996 to 2012

This shortfall can be attributed to a number of factors, including (a) reduced funding in 2003 which undermined confidence in afforestation for a number of years, (b) the dramatic increase in land prices, (c) the success of competing land schemes e.g. REPS, (d) the progressive withdrawal of Coillte from afforestation since 1997 following an adverse decision by the European Commission on its eligibility for premium payments although this was in part mitigated by the entrance of private investment sources such as pension funds and (e) constraints on land availability due to increased regulatory requirements.

The target for broadleaves was increased from 20% to 30% of afforestation in 2001. In contrast to the overall level of afforestation, this target was met in 2006 and exceeded in subsequent years (ITGA 2010).

Environment - Significant progress has been made in seeking to ensure that forestry development is compatible with the protection of the environment. A suite of environmental guidelines addressing biodiversity, water quality, archaeology, landscape, harvesting and aerial fertilization were introduced in 2000 with the understanding that they would be reviewed on a regular basis. Compliance is required as a condition of planting approvals, grant aid and felling approvals. The guidelines are to be updated to reflect legislative changes and advances in the knowledge of forestry environmental impact.

The approval process for afforestation now includes statutory consultation with certain prescribed bodies including Local Authorities; Inland Fisheries Ireland; the Environment Protection Agency (EPA); Department of the Environment, Community and Local Government; Department of Arts, Heritage and the Gaeltacht, Fáilte Ireland and An Taisce, along with public consultation in certain circumstances. The threshold for mandatory environmental impact assessments (EIAs) has been reduced to 50 ha and can be less where the proposed development is adjudged to have the potential to have a significant environmental impact. The Indicative Forestry Statement (IFS) was developed and introduced by the Forest Service in 2008 to assist in the planning of future afforestation.

In 2008, the Forest Environment Protection Scheme (FEPS) was introduced for REPS farmers with an increased focus on the planting of broadleaves and on environmental enhancement measures. There is no link between FEPS and the new Agri-Environment Options Scheme (AEOS).

The Native Woodland Scheme was introduced in 2001 to provide grant aid for the restoration of existing woodlands, conversion of conifer stands to native woodland (Element 1) and the expansion of native woodlands by planting green-field sites (Element 2). Up to October 2009 4,427 ha had been restored under Element 1 and 518 ha planted under Element 2.

There has been increased awareness of the potential impact of forestry on the environment and of the importance and value of environmental public goods provided by forests including biodiversity, climate change mitigation and recreation. The review of forest policy (Bacon, 2004) estimated that the non-market benefits of forestry (recreation, carbon storage and biodiversity) were worth €88.4 million per annum with the potential to increase to €126 million under the targeted afforestation programme. The biodiversity benefit from the existing estate was valued at €5.6 million per annum based on 10% of the estate meeting the "desired standard" for biodiversity. More recently a report on the economic and social benefits of biodiversity (DoEHLG 2008) estimated the value of ecosystem services from forestry (excluding carbon sequestration) as being €55 million per year.

Inventory and Planning – Under the Strategy, policy targeted the development of a comprehensive inventory and planning system to underpin the development of industry and the overall forest resource. The first National Forest Inventory (NFI) was completed by the Forest Service in 2007. A forecast of private sector roundwood production was published by COFORD in 2009 and an All-Ireland forecast in 2011. The second NFI was completed in 2012 and the data is currently being analysed.

A national survey of native woodlands was undertaken in conjunction with the National Parks and Wildlife Ser-

vice from 2003 -2009 based on the Forest Inventory and Planning System (FIPS) (Perrin et al. 2008, Perrin and Daly 2009).

Amenity and Recreation - Policy has aimed to encourage the provision of public access to forests, and the development of amenity forestry projects of local social and economic benefit. The Urban Woodland and Amenity Woodland Schemes were restructured and replaced by the NeighbourWood Scheme in 2001. The scheme provides funding for Local Authority and amenity groups to develop local woodland amenities in and around villages, towns and cities, specifically for public access and enjoyment. Forest recreation guidelines for forest owners and managers were introduced in 2006. The Forest Service has provided support for organisations and initiatives promoting an appreciation of trees and forests. Coillte continues to operate an open forest policy allowing for public access and in 2005 published its updated forest recreation policy. It continues to upgrade and maintain a wide network of trails and recreation sites and to collaborate with numerous organisations and bodies in the promotion of forest recreation. The demand for public access to private forests is expected to increase as they mature. It is a requirement for funding under the forest roads scheme to allow pedestrian access along the forest road.

Legislation – The policy aim of ensuring that the development of the sector was supported by legislation which was up-to-date and comprehensive has shown limited progress. A Consultative Group on the Review of Forestry Legislation was established by the Department of Agriculture and Food at the end of 2005 and concluded its work in October 2006. The Government approved the Heads of a new Forestry Bill in March 2009. In April 2013, the Forestry Bill 2013 was presented to the Houses of the Oireachtas. The purpose of the Bill is to reform and update the legislative framework relating to forestry in order to support the development of a modern forestry sector which reflects good forest practice and protection of the environment.

Harvesting and Transport – The aim of policy is the development of an efficient, economically viable, safe and environmentally-sound harvesting and transport sub-sector, which optimises wood yield consistent with good silvicultural practice, environmental protection and cost effectiveness. Good progress had been made and many of the strategic actions recommended in the report have been implemented. More recently the lack of funding and facilities for the training of machine operatives and overall harvesting capacity has been highlighted (Tarleton 2010) in the light of increasing volumes from the private sector especially from thinnings.

Forest Management – Progress on the policy aim to achieve the roundwood output envisaged and other objectives of the Plan has been mixed. The thinning and tending of broadleaves grant scheme provides support to improve forest management.

An Irish National Forest Standard based on criteria and indicators developed under the Ministerial Conference on the Protection of Forests in Europe (MCPFE) was published in 2000. The national certification standard for the Programme for the Endorsement of Forest Certification (PEFC) scheme was endorsed in December 2011. A Forest Stewardship Council (FSC) national standard was completed and approved in 2012. The absence of a national certification standard did not prevent Coillte from achieving and retaining FSC certification for its forest estate and the areas it manages on behalf of its Farm Partner and Forest Life schemes since 2001.

Sawmilling – The overall policy aim continues to be to develop an internationally competitive sawmilling sector based on sound commercial principles. The Irish sawmilling industry has restructured and rationalised over the past decade and is now modern, efficient and customer focused and has invested significantly in new technology and capacity. In 2010, the total value to the economy of the forestry sector (including sawmilling) was €2.20 billion. Direct employment in the wood products sectors was 3,910. Accounting for the induced and indirect effects, the total employment supported by the wood products sector was estimated to be 6,410 (FORECON 2011). Progress on identified strategic actions has been made through the introduction of an electronic auction system for log sales by Coillte in 1997. Enterprise Ireland, formerly Forbairt, has provided assistance to mills for product and process research and development. However, overcapacity continues to be an issue due to an expectation of increased domestic log supply. Due to the contraction of the domestic sawnwood market, there has been an increased emphasis on export markets and this will continue.

Research and Development – The policy aim on research is to promote research and development focusing on the strengths of the Irish forestry sector with particular emphasis on market demands, industrial needs, environmental concerns and cost efficiency. Strategic actions outlined in the 1996 policy included COFORD developing a costed, phased and prioritised upgrading of the national research and development (R&D) effort, taking into account the need for increased private sector involvement and the need for balance between fundamental and applied R&D. The programme was developed and revised on a five-year basis in line with changing information demands and

emerging issues such as biodiversity, climate change mitigation and management of broadleaf plantations. Priority areas were addressed in calls for proposals under successive Operational Programmes, which came under the National Development Plan. State investment in the COFORD programme grew (in 2009 terms) from just under €2m in 1994 to over €4 m by 2009, a year-on-year increase of 5%.

COFORD has published over 60 reports and books on forest practice and policy and over 100 COFORD Connects advisory notes and co-ordinated research activities with Coillte, EPA, Sustainable Energy Authority of Ireland (SEAI) and the Marine Institute.

In 2009 the forest research functions of COFORD were merged with the Research Division of Department of Agriculture, Food and Fisheries (DAFF). The COFORD Council continues to have an advisory role in relation to the national forest research programme and in addressing development issues in the forest sector, such as wood supply and demand dynamics and related issues.

Education and Training – The overall policy can be stated as to ensure the availability and delivery of suitable programmes of education and training for the development of the sector. Progress has been made on a number of fronts. In addition to UCD, degree courses in forestry are now available through the Waterford Institute of Technology (WIT). The Galway Mayo Institute of Technology (GMIT) closed its forestry degree course in 2010. Teagasc offers a two year course leading to a Further Education and Training Awards Council (FETAC) Vocational Certificate in Forestry together with a series of short courses on various aspects of forestry and forest management targeted at farm forest owners. Teagasc also provides short adult training courses for farm forest owners to support them in the development of their forest knowledge and skills. In 2007, Forestry Training and Education in Ireland (FTEI) was established as a limited company to advance training and education in forestry in all its aspects, to encourage the study of forestry training and education and to maintain and improve standards of work practices in forestry. The lack of funding has seen a contraction in the range of training courses for forest operatives, professionals and forest owners. A review of training needs for the harvesting sector has highlighted the shortcomings of the current approach to training (Tarleton 2009).

Coillte – The overall policy in *Growing for the Future* is to support the commercial development of Coillte so as to maximise, within the context of the Strategic Plan, the benefits from public forestry and to secure the optimum development of the sector. Since 1996, the company has grown, remained profitable, expanded into a number of related businesses and increased the value of its asset base. It is now divided into three businesses: Coillte Forest, Coillte Panel Products and Coillte Enterprise. Coillte Forest manages all aspects of the estate of 442,000 ha of which 389,000 ha is afforested. It withdrew from afforestation in the late 1990s following a decision by the European Commission that as a public entity it was ineligible for premium payments under Council Regulation 2080/92. At almost 85% market share within the ROI (COFORD 2011a), it remains the dominant supplier of roundwood, selling approximately 50% standing and 50% harvested material through its electronic auction system. Coillte Panel Products (CPP) comprises Smart*Ply* Europe Limited, with a productive capacity of circa 330,000 cubic metres per annum, and Medite Europe Limited, with a productive capacity of approximately 440,000 cubic metres per annum. Coillte initially became involved in the manufacture of panel products in the mid 1990s through a joint venture with Louisiana Pacific. It bought out their 65% share in 2002. Coillte purchased Medite from Weyerhaeuser Europe Ltd in 2006 and in doing so became the largest user of small diameter roundwood and residues in Ireland. Coillte Enterprise consists of land sales and development, provision of sites for telecom masts, renewable energy, forest nurseries and provision of training and safety services.

1. Expansion of the Forest Resource Area

Current Features

The national forest estate has increased from an estimated 576,000 ha at the beginning of 1996 to 731,650 ha in 2012. Of this, approximately 46% is privately owned and the remaining 54% is State owned, primarily by Coillte Teoranta.

The private sector, particularly farm owners, now dominates afforestation and the State, through Coillte, has played a very minor role since 1997, having afforested only 250 ha per annum over the past ten years. Private non-farmer investment in afforestation has fallen significantly in recent years due to the high cost and limited availability of land coupled with the significant funding differential whereby farmers receive on average three times more premium funding than non-farmers.

Annual afforestation has decreased from over 20,000 ha in 1996 to just over 7,000 ha over the past three years. Afforestation is now 50% of the target set in *Growing for the Future*. Afforestation is driven by the availability of grant and premium supports and their relativity to other farm schemes, agricultural commodity prices and expectations in relation to the revision of the Common Agricultural Policy (CAP). The supports discriminate positively in favour of farmers and broadleaf tree species. Little or no afforestation would take place in the absence of these support measures.

For grant purposes, a minimum yield class of 14 is applied to Sitka spruce. There is no overall national target for yield class, despite the link between yield class and levels of future volume production for industry and wood energy. Sitka spruce continues to be the main species planted. However, it is now planted as part of a diverse species mixture[8]. Broadleaf species, in particular ash, alder and oak now account for more than the targeted 30% of annual afforestation. This includes broadleaves planted for amenity and landscape purposes.

The Forest Service introduced a number of changes to the afforestation scheme in December 2010. The most notable were (a) to limit the amount of unenclosed land in any single application to 20%, (b) to reduce the stocking densities for alder, oak and beech, (c) to reduce the 20% diverse category to 10% (d) reduce the grant payments by circa 10% and reduce the premium payments for unenclosed planting for new approvals and (e) eliminate the area differential for premium payments.

There was a significant fall in the demand for planting approvals in 2011. By the end of the year applications had decreased by 41% (by area) compared with 2010, while approvals had decreased by 34% (Source – Forest Service Monthly Report December, 2011). This trend was reversed in 2012 where applications increased by 34% (area basis) and approvals by 16% (area basis) compared with 2011 (Source – Forest Service Monthly Report December, 2012).

Afforestation is subject to a broad range of requirements including environmental guidelines, public consultation and reduced thresholds for EIA. In recent years the requirements of EU environmental legislation particularly the Habitats and Birds Directives has introduced a need for appropriate assessment of forest activities in protected areas in order to ensure compatibility of forestry and nature conservation objectives in these areas. In some cases this has restricted the area of land on which afforestation can occur.

The forest nursery sector comprises a small number of relatively large and modern nurseries and an increasing number of smaller specialist producers focusing on broadleaf and native species. The majority of nursery production is bare-root with cold store and containerised plants being used to extend the planting season. The sector has suffered due to the downturn in afforestation. Current production is estimated as being of the order of 45 million plants but the sector, which expanded in line with an increased afforestation programme, has an estimated capacity of 75 million or almost double current production levels.

The National Survey of Native Woodlands incorporated information on 1,320 woodland sites surveyed across the country during 2000-2007 (Perrin et al, 2008). A preliminary list of possible ancient woodlands was also drawn up (Perrin and Daly 2009). The findings provide a valuable insight into the condition and status of and threats to the native woodland resource. The area of native / semi natural woodland is estimated at 85,000 ha (NFI, 2007). The resource is highly fragmented and scattered and the individual woods are mostly small (66% <10 ha). Approximately 4,250 ha of native woodland are designated as nature reserves or national parks, 6,500 ha as Special Areas of Conservation (SACs) (including nature reserves and national parks) and another 23,500 ha have been identified as potential Natural Heritage Areas (NHAs).

The trial planting of fast growing short rotation crops, some of which may be managed under a coppice system, has recently been undertaken on a limited scale by Coillte and others. Technical appraisal and costing of such approaches is being undertaken by the Department of Agriculture, Food and the Marine.

[8] In the Forestry Schemes Manual (Forest Service 2003) there are two diverse species categories: GPC 3 (20% Diverse) and GPC 4 (Diverse). GPC 3 was changed in 2011 to 10% Diverse. A diverse species is a suitable conifer species other than Sitka spruce or lodgepole pine.

Policy Considerations

The long term forecast of roundwood production (conifer and broadleaf) shows a steady increase in volumes up to 2035 followed by a dramatic decrease in the following ten years. The extent of this decrease is dependent on afforestation rates, the productivity of the species being planted and on the species mix. At current levels of afforestation the estimated volume production will fall from over 8 million cubic metres in 2035 to just less than 5 million cubic metres by 2049. To address this trough in future supply and to achieve the percentage forest cover set out in *Growing for the Future*, it will be necessary to extend the period of afforestation envisaged to 2045 assuming an afforestation programme of circa 15,000 ha per annum.

Analysis of soil types suitable for afforestation, including their current land use indicates that there is sufficient potential supply of suitable land available for the afforestation levels considered in this report[9]. This analysis was limited to soil types only and did not address designated areas unavailable or with limited application for afforestation.

The State continues to view forestry as one option primarily for farmers in a suite of supported land-use schemes. The aim should be to ensure that the national land resource is used productively and effectively. A balanced set of policies and measures is needed so that this objective is achieved. Afforestation targets are unlikely to be achieved in the context of the relative levels of current agricultural supports.

The long term forecast of broadleaf production shows a steady increase over the next half century. The ability of this resource to sustain a viable hardwood processing industry is dependent on a combination of suitable species, correct tending and management and inherent timber quality. The impact of a 15,000 ha afforestation programme on future woodflows is to significantly reduce the estimated decline in roundwood supply post 2035 and the number of years before recovery in supply takes place (Appendix 5).

The onus for the expansion of the forest estate now rests primarily with the private sector. State organisations which have land assets, apart from Coillte, have by and large not been involved in meeting national targets, even in relation to purely environmental planting. There is potential for limited planting of native species within National Parks and expanding native woodlands onto some industrial cutaway peats.

The current State support model for afforestation which provides for up to the full cost of afforestation and a premium payment of up to €515 per ha for 20 years (farmer) or in the case of a non-farmer a maximum premium of €195 per ha for 15 years is questionable in the current economic climate. The cost per ha over a twenty-year period to the State (grants and premiums) can be as much as €16,000 for broadleaves. The State's role is to incentivise afforestation where there is a recognised market failure but needs to avoid the development of a sector which is reliant on its support. This presents a very significant challenge and cannot be done in isolation from overall agricultural policy and other land-use support measures.

The expansion of the forest estate must be compatible with environmental sustainability and must be undertaken in a planned manner that ensures that only appropriate afforestation takes place in accordance with the principles of sustainable forest management (SFM[10]) which balances the economic, environmental and social aspects. Environmental protection and enhancement measures will need to be adequately communicated and supported to ensure that they are fully understood and that all stakeholders are aware of their respective responsibilities.

The current approach to afforestation requires that each new plantation complies, site permitting, with species targets and facilitates the full range of environmental benefits while at the same time being economically viable. This can lead to sub-optimisation of benefits at a national level. An alternative would be to divide the afforestation programme into two main components, one with the provision of environmental services and social benefits as the principal management objective and the second component with commercial forestry and the production of timber as the principal management objective. Areas, with the main objective as the provision of environmental services and social benefits, would still provide timber benefits but as a secondary objective while areas with production of timber as the main aim would provide environmental and social benefits but not as their primary objective.

The Indicative Forestry Statement , Forest Service, 2008 (Available at IFSDoc_Dec08.pdf and other GIS land use tools which aim to provides high-level, national guidance in relation to the suitability of land for afforestation and facilitate the establishment of forests serving a variety of purposes have potential for wider application as for example to identify the most appropriate areas for environmental and timber production objectives and could be overlaid with river basin plans and other data layers to guide afforestation including the expansion of the native woodlands.

The overall aim of the Indicative Forestry Statement (IFS) is to provide high-level, national guidance in relation to the suitability of land for afforestation. One of the key aspects of delivering a balanced programme is to ensure, as far as possible, that new forests integrate, enhance and reflect the diversity and local distinctiveness of the landscape in which they are set. It is also fundamentally important to provide the public and the forest industry with the earliest indication of

[9] Potential level of land available for afforestation that is marginal to economic agriculture and the likely level of productivity that can be attained on it using Sitka spruce. Unpublished report by Niall Farrelly, Teagasc, Forest Research, Mellows Centre, Athenry, Co Galway.

[10] The MCPFE defines SFM as *the stewardship and use of forests and forest lands in a way, and at a rate, that maintains their biodiversity, productivity, regeneration capacity, vitality and their potential to fulfil, now and in the future, relevant ecological, economic and social functions, at local, national, and global levels, and that does not cause damage to other ecosystems.*

Pole harvesting in a mature conifer plantation

the areas where potentially sensitive issues may arise in relation to, for example, landscape, water quality, archaeology and biodiversity. Because of the large number and density of recorded archaeological monuments they are not represented on the IFS national map. Instead all forestry applications that may affect an archaeological monument or site are forwarded to the Forest Service archaeologist who consults with the National Monuments Service (NMS). It is planned that maps of all 'archaeological areas', 'zones of archaeological potential', 'zones of archaeological amenity' and World Heritage Sites will be included on the IFS map when digitisation is finalised by the NMS[11].

The IFS is a map-based approach which integrates many different spatial datasets which take account of a wide range of environmental factors and other opportunities and constraints. The IFS identifies areas most suitable for planting primarily on the basis of environmental considerations and soil-productivity. The map-based environmental considerations have been captured from a variety of state organisations, such as the National Parks and Wildlife Service, the Fisheries Boards, the EPA and the Local Authorities. The forest productivity map was compiled in co-operation with Teagasc and is based on soil type and elevation, displaying the potential rate of growth of forests throughout the country.

Climate change is a reality and poses a serious threat with impacts on Irish forests. The climate of Ireland is predicted to get warmer and drier in the southeast and wetter in the west, with an increase in the frequency of droughts and floods (McGrath et al. 2005). The temperate forest oceanic regions of Europe are estimated to be subject to increasing changes in storm, insect and pathogen disturbance regimes along with shifts in tree species compositions (EFI 2011). These changes pose a risk to forests in Ireland and are likely to impact on the performance of the tree species now being planted. Drought will impact on the productivity of certain species (Ray et al. 2010) and may lead to an increased frequency of forest fire. Future species choice (this could require more extensive use of mixtures and species more resilient to drought and insect attack) should reflect these long term changes in climate and forest management should aim to increase adaptability to the impacts of climate change. The CLIMADAPT tool has a role to play in guiding species choice and related management decisions (available at http://82.165.27.141/climadapt_client/index.jsp).

An analysis of grant aided plantations shows that there are over 44,000 ha where the plantation size was less than 5 ha and that almost 25% of the private forest area was more than 100 metres from a county road. Accessibility is vital if plantations are to be thinned and roading costs kept within economic levels. Increased plantation size and proximity to existing plantations will make them more attractive for thinning and facilitate cost savings at time of harvesting.

The use of broadleaves envisaged in this policy reduces roundwood production in the shorter term due to their lower growth rates. For this reason, the area to be afforested has been increased while at the same time volume production targets have been reduced compared with *Growing for the Future*. Opportunities to increase volume production include the choice of faster growing tree species and the use of improved planting stock for the main conifer species. Improved Sitka spruce would result in an increase of at least one yield class.

The COFORD Roundwood Demand Group estimates that the demand for wood fibre for energy will increase to 1.7 million cubic metres between now and 2020, in a scenario that assumes significant expansion of the purpose-grown energy crop area and a substantial level of imported material. The increased levels of afforestation recommended here will not begin to contribute volume production until 2028. There may be scope to increase the level of harvest and biomass recovery from existing plantations over and above forecasted levels. Nevertheless, even under the most optimistic scenarios, the wood energy supply gap is likely to be in the region of 1-1.25 million cubic metres per annum, about one third of the current overall level of supply. Imports of wood fuels such as woodchip and pellets could address this shortfall but there is also potential to mobilise additional indigenous supplies of biomass from short rotation coppice (mainly willow) and short rotation forestry (fast growing conifers and broadleaves). Achieving an appropriate balance between short rotation coppice/forestry and conventional afforestation also needs to be considered, given the underlying objectives of security of energy supply and climate change mitigation. Afforestation provides a wider range of mitigation opportunities (including carbon sequestration, materials substitution and fossil fuel replacement) compared with biomass crops as well as non-timber benefits. Given the likely level of future State/EU investment that will be involved in biomass crops and afforestation, DAFM should examine these issues.

Forest nurseries, due to the lead in time to produce planting material, have greater exposure to changes in afforestation levels. It is vital that forest nurseries trade profitably so that they are able to invest in new technology to ensure the ready availability of planting material suited to fulfilling the planned afforestation programme. Dramatic or unsignalled changes in species requirements and / or approved afforestation programmes could result in closures with a knock on effect on plant supply and competition within the sector.

The quality and productivity of forest plantations are dependent upon the genetic quality of the seed and reproductive material used during establishment. Forest nurseries have an important role to play in ensuring that the genetic quality of planting stock is well adapted and fit for purpose and that improved planting stock is made available for future planting programmes. This should include selection and improvement of native species such as alder, ash, and birch.

[11] Whilst not visually represented at present on the IFS national map, potential impacts on "archaeological areas", "zones of archaeological potential", and World Heritage Sites, are also taken into consideration. See pages 27 to 29 of the Environmental Report for further details.

Policy Statement

To increase the forest area, in accordance with SFM principles, in order to support a long term sustainable roundwood supply of 7 to 8 million cubic metres per annum.

Strategic Actions

1.1 The afforestation target will be 10,000 ha per annum up to 2015 and 15,000 ha per annum for the period 2016 to 2046. This will, with reforestation of clearfell areas, provide a forest cover of 18%. Targets will be reviewed by DAFM every five years beginning in 2016 in the context of long term sustainable roundwood supply and other policy considerations.

1.2 Within the context of this policy and Food Harvest 2020, DAFM to develop an integrated approach to the achievement of these targets across land uses and schemes.

1.3 The broadleaf target remains at an area equivalent to 30% of the annual afforestation programme. To broaden the scope and responsibility for increasing the area of broadleaves, DAFM will introduce an overall indicative national target level of 10% broadleaf species in reforestation, taking into account economic and site suitability considerations. This will be monitored and reviewed periodically.

1.4 DAFM to encourage State organisations and Local Authorities to convert part of their land bank holdings to public purpose forestry and in particular native woodlands.

1.5 DAFM in collaboration with the National Parks and Wildlife Service of the Department of Arts, Heritage and the Gaeltacht (DAHG) to establish an appropriate annual target (minimum 150 ha) for the restoration and expansion of native woodlands focussing on alluvial and sessile oak woodlands. The expansion of native woodlands is additional to the afforestation target above.

1.6 DAFM to commission a study in 2014 to examine the implications of forest support payments linked to management interventions and the delivery of products / services.

1.7 DAFM to introduce, as part of the afforestation grant application and forest management planning process, a template setting out owner and State objectives, outputs and levels of support, which would facilitate early owner involvement / awareness and serve as a basis for ongoing management review (by the owner) and preliminary input to the proposed Forest Management Planning process (see also 2.1).

1.8 DAFM to periodically review the cost basis for grant support for afforestation to ensure that efficiencies and technical advances are reflected in the approved rates and that the State obtains value for money. DAFM to examine the impact of amending future premium payments and of limiting premiums to 15 years with particular regard to achieving afforestation targets.

1.9 DAFM to review the incentives for planting larger areas and for consolidating existing forest areas to increase long term competitiveness and efficiency in harvesting and transport.

1.10 DAFM to reduce the differential between farmer and non-farmer premiums and review annually to determine whether further differential adjustments are warranted to mobilise private sector and institutional investment.

1.11 DAFM in collaboration with the wood products and wood energy sectors and other stakeholders should regularly review the most appropriate species mix to meet expected market needs taking into account sustainable forest management and climate change adaptation needs.

1.12 DAFM to monitor and, in consultation with stakeholders, periodically review the overall average yield class for afforestation as set out in *Growing for the Future* in the light of the quality of land being afforested and the more widespread use of genetically improved planting stock with a view to increasing both the minimum and average productivity levels.

1.13 With a view to achieving the national afforestation target and roundwood supply potential and the development of a forest culture among farmers and other landowners, DAFM to undertake a concerted two year promotion campaign to encourage afforestation and more active forest management in collaboration with Teagasc, forest companies and owners representative organisations including for example harvesting demonstrations and field days which show the impact of forest management activities on cashflows.

1.14 The use of genetically improved planting material (see Glossary for definition) e.g. improved Sitka spruce, as distinct from genetically modified material, which will deliver improved timber quality and timber wood volumes will be supported.

1.15 The potential for sequestered carbon to finance future afforestation will be investigated and, if appropriate, a carbon afforestation scheme which favours management systems and species with good long-term sequestration potential will be considered.

1.16 DAFM in collaboration with the Department of Communications, Energy and Natural Resources to undertake an appraisal of the appropriate balance between afforestation including short rotation forestry[12], biomass support schemes and other related measures such as agroforestry in meeting renewable energy, climate change mitigation and forest industry raw material needs, in the context of the overall level of roundwood availability.

1.17 DAFM to continue to support the dissemination of the CLIMADAPT species selection tool and any necessary updates.

1.18 DAFM will consider proposals for the establishment of riparian woodlands with a view to their function in mitigating flooding and enhancing water quality (see also 3.12).

[12] Short rotation forestry refers to fast growing species typically managed on a 12 to 15 year rotation

2. Management of the Resource

Current Features

The first statistically based National Forest Inventory (NFI) was begun in 2004 and completed by the Forest Service in 2007. The purpose of the NFI was to record and assess the current extent, status and composition of Ireland's forest resource, both public and private, in a timely, accurate and reproducible manner. The NFI will also be used for reporting under Kyoto and for the provision of statistical information to the Food and Agriculture Organisation (FAO) and similar bodies. The NFI is planned to be repeated on a five year cycle. The field work for the second NFI was completed in 2012 and the data is currently being analysed.

Coillte's own stand-based forest inventory and geographic information system (GIS) produces forecasts of roundwood volume production every five years based on forest management plans which are updated at regular intervals.

The first geospatial forecast of roundwood production from private sector forests was completed in 2009 and provided forecasts at national, regional, county and catchment levels. Work is ongoing on using the NFI plot data as a basis for forecasting. An all-Ireland forecast combining information from Coillte, the Northern Ireland Forest Service (NIFS) and the private sector forecast has been completed. There is now an enhanced national competence in production forecasting.

The gap in recent years between Coillte's forecast volume for the 14cm and larger diameter category and the harvested supply volume has widened. There is no estimation of annual allowable cut (AAC) at a national level[13]. There is a Forest Service procedure whereby Coillte's annual harvest programme is compared with the estimated annual increment of its forest estate.

The Code of Best Forest Practice published in 2000, sets out, for each stage of the forest cycle, those operations and procedures which are in keeping with sustainable forest management.

An estimated 95% of grant-aided forests are managed on a clearfell system although there is increasing interest in continuous cover forest (CCF) silvicultural systems especially for broadleaves. Good management practices are needed in harvesting in sensitive catchments to mitigate possible sedimentation and nutrient runoff. There is support for the contention that, when compared with clearfelling, CCF systems can provide enhanced climate change mitigation benefits and improve delivery of biodiversity objectives and other environmental services (Bosbeer et al 2008).

Owners of grant-aided plantations of over 10 ha (5 ha for broadleaves) are required to submit in hardcopy to the Forest Service a simple two page management plan for years 4 to 10 and a second basic management plan at age ten for years 11 to 20. The tending and management of grant-aided forests is left to the individual owner and there is no requirement for active forest management apart from that necessary for continuation of premium payments.

Forest owner groups are beginning to develop among private owners. There are now twenty-five groups supported by Teagasc at various stages of development. Forest owner groups can help small forest owners develop awareness of the need for forest management, reduce costs of production and may have a role in achieving forest certification.

The private grant-aided forest estate due to its age structure is as yet largely unroaded. The funding for the Roads Scheme is insufficient to access those crops due for thinning while the stop-go nature of the scheme has meant that increasingly plantations are being left unthinned although progress has been good in 2010 and 2011. Other constraints on roading include lack of awareness among some owners of the need for timely planning for roading and thinning and the implementation of the Environmental (Miscellaneous Provisions) Act, 2011.

Policy Considerations

The Forest Service supports the drafting of management plans at age 10 for grant-aided plantations over 10 ha (5 ha for broadleaves). The scope of the management plans is basic and they are not entered into any form of electronic information retrieval system. Enhancement of the management plan format in line with the requirements of certification to support the principles of SFM and prescribe the appropriate management regime and the use of this information to support the forecasting process would provide for more reliable roundwood production information at national, regional, county and catchment levels, thus facilitating improved investment decisions by the process-

[13] The annual allowable cut is the amount of wood permitted to be harvested within a one year period to ensure the sustainability and productivity of the forest resource. AAC's normally over a ten year period are determined for each Forest Management Unit and for the national forest estate as part of the forest management planning process.

Forest nursery production, Coillte Nursery, Ballintemple, Co Carlow

ing and wood energy sectors. Coillte has developed an integrated forest management planning system with a scope and capability over and above that envisaged to be introduced to the private sector. Thus it will be important to ensure that both systems are aligned.

At a project level, the lack of an initial statement of objectives and management plan has arguably lessened the level of return on investment. In order to achieve a better return, the wider use of forest management planning, which sets out both owner's and State's objectives, the levels of support and the benefits / products or services to be achieved needs to be put in place.

The annual allowable cut (AAC) which is typically calculated during the preparation of forest management plans (FMPs) provides an indicator of the permissible volume that can be harvested in each year of the FMP. Harvesting at levels greater than the AAC will impact on the sustainability of the resource, thus the AAC can be viewed as an indicator or parameter against which sustainable forest management can be monitored. The approach adopted in Ireland is to simply reforest the same areas that are clearfelled and use this as evidence that the forest resource is being managed on a sustainable basis. There are a number of shortcomings with this approach in that areas can be clearfelled at almost any age impacting on the sustainable level of roundwood production but once they are reforested, then the impact is assumed to be zero. The estimation at a national level of an AAC would enable the management of the forest resource to be objectively assessed and monitored for compliance with SFM. Equally the estimation of an AAC for State forests under the stewardship of Coillte would provide the two shareholders (Minister for Finance and Minister for Agriculture, Food and the Marine) with a further criterion to monitor the management of the forest resource.

Although premium inspections undertaken by the Forest Service require that the plantations retain the potential to form a commercial crop or have not reverted to an alternative land use, there is no direct link between premium payments and the management of the plantation. The main emphasis to date within the sector has been on afforestation with limited attention on the active management of these areas.

Unless the NFI is repeated at regular intervals, Ireland's reporting under the United Nations Framework Convention on Climate Change (UNFCCC) will be required to use the prescribed default methodologies. These defaults are conservative and based on current estimated sequestration levels could reduce the volume of carbon sequestered by up to 30% which will bring an onus to purchase additional carbon credits for national compliance with emission reduction targets. The field work for the second NFI was completed in 2012 and the data are currently being analysed. When published it will provide valuable information on growth increment, which can be used to estimate the AAC (annual allowable cut) and to report against the principles of SFM.

The COFORD Wood Supply and Demand Group reports show a significant shortfall between projected timber supply and wood fibre demand especially for wood energy. Any increase in roundwood production over existing levels can only come from privately owned forests as Coillte's production forecast for the next two decades is relatively flat. Notwithstanding the role that harvesting infrastructure and owner awareness plays, the increased private sector production can only be accessed if there is a long term commitment to the funding of forest roads. Obviously it makes sense to ensure that the funding is put to best use in terms of wood volume accessed per unit of funding while recognising that for smaller areas, a simple bell-mouth entrance may suffice. Implementation of any new proposed roads programme will require procedures whereby private owners can signal their intentions to harvest crops in advance as for example through the proposed forest management planning system.

The forest industry and wood energy sectors, if they are to develop, require reliable forecast information to underpin any future investment. Although good progress has been made in forecasting, the lack of information on owners' intentions is a major shortcoming of the current private sector forecast. The integration of the forest management planning process with the integrated forest information system (iFORIS) would improve the basis and reliability of private sector forecast volumes and could also enable private owners to avail of the forecasting capacity for their own management purposes.

Continuous cover forestry (CCF) silvicultural systems encourage structural and species diversity and result in uneven-aged and mixed species type forests (Ní Dhubháin et al. 2010). This in turn can increase the resilience of forests to pests and diseases; extreme weather events; as well as facilitating carbon storage and benefitting biodiversity and ecosystems services. Coillte initiated trails with CCF in 2002 with a focus on conifers, however, more recently, Coillte's Low Impact Silvicultural Systems (LISS) policy states that all broadleaf high forest (BHF) will be managed under CCF and that CCF will be the favoured silvicultural system in amenity area (Ní Dhubháin et al. 2010). CCF has a role to play in Irish forestry and not just for amenity and recreational areas. Further research will be necessary to determine the most appropriate practices for the management of plantations under CCF silvicultural systems.

Wood has a role to play in ensuring that secure sources of renewable energies are developed in line with the Government's Energy White Paper 2007. Oil is becoming scarcer and increasing in price with knock-on effects on oil-based products such as artificial fertilizers. Forest management practices will need to adapt to embrace the requirement for wood energy and the implications of decreasing oil resources.

In 2007, COFORD published "Sustaining and Developing Ireland's Forest Genetic Resources – An outline Strategy. This report, which was developed by a working group brought together and chaired by COFORD, to review national forest genetic resources, contains a number of recommendations designed to safeguard and enhance Ireland's forest genetic resources on a sustainable basis.

Long-term forest monitoring is an essential activity to ensure sustainable use of forestry resources. There are currently many international long-term monitoring/research projects dealing with health and biogeochemistry, climate change mitigation and adaptation, biodiversity, nutrient status and phenological observations (see Chapter 6 Forest Protection and Health) There is now an opportunity to better integrate all monitoring, long term research projects and national forest inventory (NFI) activities. The NFI now provides vital baseline information across a nationally representative sub-sample of forest types and habitats. This could be used, for example, to assess biodiversity, to monitor the impacts of climate change or to estimate the climate-mitigation potential of forest ecosystems, thereby contributing to EU and UNFCCC reporting commitments.

Policy Statement

To ensure the sustainable management of the forest resource in accordance with best practice thereby ensuring its capacity to provide the full range of timber and other benefits.

Strategic Actions

2.1 A system to standardise data requirements, on an electronic platform, for private woodland managers/owners should be introduced from 2014 in consultation with sector stakeholders. This would include a mandatory requirement for standardised Management Plans for privately owned woodlands, with a commitment for provision and updating of same as a condition of afforestation from 2014 onwards and as a condition of roads and other support measures as well as a precondition for felling licences for thinning. The current format and scope of Management Plans will be revised to support SFM, facilitate certification, the forecasting of future roundwood supply, felling compliance and public good functions and incorporate their design, submission, updating, review and analysis into the iFORIS system while ensuring alignment between private and public sector management planning systems.

2.2 DAFM should establish a National Forest Inventory and Management Planning Unit with responsibility for ongoing national inventory, collation of private inventory data, SFM reporting, national reporting, national forecasting and the design and approval of forest management plans in the context of permitted activities.

2.3 Continue to repeat the NFI on a 5-year cycle, and based on active engagement with the private sector incorporate the collection of additional plot information which will facilitate the use of NFI data for reporting and forecasting purposes.

2.4 Consideration will be given to support for projects and measures which improve the level of accuracy, reliability and relevance of timber forecasting.

2.5 Collaborative mechanisms for the management of privately owned forests will be actively encouraged and their use to enhance the delivery of the full range of forest benefits investigated.

2.6 Recognising the market failures which would prevent early production from private forests and the economic benefits of first (and subsequent) thinnings, funding for two consecutive priority 5-year harvesting roads programme, of at least 45,000 ha and 32,000 ha respectively for privately owned forests will be provided to enable access to and delivery of the forecast volumes in the COFORD all-Ireland forecast of net realisable volume 2011-2028.

2.7 DAFM to work with the Department of the Environment, Community and Local Government to ensure an efficient implementation of a unified consent system for forest roads and entrances that supports timber mobilisation and maintains the competitiveness of the sector (see also 11.1). This should be coupled with updating of relevant guidelines (see also 4.9). The implementation of the Environmental (Miscellaneous

Provisions) Act 2011 needs to be reviewed in terms of how it is applied to the sector in order to maintain its competiveness.

2.8 DAFM to explore ways of linking existing and future premium payments for plantations over ten years with specified forest activities that provide for the active management and protection of the forest resource and the environment and appropriate reporting of timber inventory and other outputs (see also 2.1).

2.9 The current mechanisms of informing the forest sector and in particular forest owners will be reviewed, and where appropriate more effective initiatives and measures will be put in place including more direct collaboration with stakeholder representative organisations.

2.10 The conversion of plantations to continuous cover forest (CCF) will be supported by initiatives and measures to heighten awareness of and/ or promote alternative silvicultural systems.

2.11 DAFM will encourage the management of all broadleaves including native woodlands for timber production and where there is a particular conservation or protection requirement, shall, in cooperation with the National Parks and Wildlife Service and other Government agencies, facilitate management that is compatible with such objectives.

2.12 DAFM to establish a representative National Forest Genetic Resources Advisory Group to guide all aspects of future genetic requirements and advice on the management of reproductive material and tree improvement and breeding programmes including formalising the national tree improvement programme.

2.13 Integrate and develop the current monitoring schemes on forest health and biogeochemistry, climate change mitigation and adaptation, biodiversity, nutrient status and phenological observations within the NFI framework and use them to assess biodiversity, and monitor the impacts of climate change, thereby contributing to the improved future management of the forest resource.

3. Environment and Public Goods[14]

Current Position

The Birds and Habitats Directives, introduced in 1979 and 1992 respectively, are designed to protect threatened, rare and vulnerable species and habitats across Europe and to ensure their survival. Measures associated with achieving this objective focus on management of Special Protection Areas for Birds (SPAs) and Special Areas of Conservation (SACs) although measures are not limited to such sites. One of the key protection measures is to ensure that the possible nature conservation implications on a Natura 2000 site of any plan or project is considered before a decision is taken to allow that plan or project to proceed (referred to as 'appropriate assessment' as described in Article 6 of the Habitats Directive).

To this end, the Forest Service operates an Appropriate Assessment Procedure (AAP) which is applied to all forest related activities requiring Forest Service consent, i.e. afforestation, forest road construction, felling (thinning and clearfell/replanting) and aerial fertiliser application.

The overall expansion of the forest estate as envisaged in this Review will not be contingent on afforestation in Natura areas. Such planting will only receive approval if the Forest Service, through the application of the AAP, has determined that the project - either alone or in combination with other plans or projects - will not significantly affect the Natura site. There will continue to be a focus on the use of the Native Woodland Establishment Scheme in Natura areas, where compatible and in partnership with landowners and the National Parks and Wildlife Service, to contribute to the protection of relevant habitats and species.

Full details of the operation of the AAP are set out the Forest Service Appropriate Assessment Procedure Information Note (see consolidated version March 2013).

The Forest Service is currently engaged in specific initiatives regarding Freshwater Pearl Mussel (FPM) and Hen Harrier, both of which are species of high conservation value and under significant threat. Regarding FPM, the Forest Service is currently developing Catchment Forest Management Plans for eight priority FPM catchments identified as having the greatest potential for the successful long-term conservation of the species. Regarding Hen Harrier, the Forest Service will be inputting to the development by National Parks and Wildlife Service of a Threat Response Plan for SPAs designated for the species which commenced in mid 2013 and is expected to be completed by mid 2015.

Both processes recognise the potential impacts that can arise from forestry, and also the potential contribution this landuse can make to the protection of each species. Both processes will also involve detailed consultation with forestry stakeholders. Further details are set out in the document entitled *Environmental Report on the Forest Policy Review*.

The NeighbourWood Scheme introduced in 2001, provides funding for Local Authority and amenity groups to develop local woodland amenities in and around villages, towns and cities, specifically for public access and enjoyment. The People's Millennium Forests planted and/or restored 18 native woodlands in 2002/3 as part of the celebrations of the new millennium. The Native Woodland Scheme, introduced around the same time, focuses on restoring and creating new native woodlands.

Coillte continues to operate an open forest policy allowing for public access and has upgraded and maintains a wide network of trails and recreation sites and collaborates with numerous organisations and bodies in the promotion of forest and outdoor recreation.

Fitzpatrick and Associates (2005) in their analysis of the Coillte estate estimated that annual visits were 18 million[15] and provided a non-market value of €97 million annually. However, this may be an underestimate in light of the preliminary findings of a study commissioned by Coillte and the Council which although completed has yet to be published. The total economic activity generated by domestic forest users is estimated at €268 million.

Access to private forests is low although there is a requirement for public access (limited to the forest road and not the forest) under the Forest Roads Scheme.

The Forest Service provides support to organisations which promote the awareness of forests, and their provision of public goods.

Contribution to climate change by forests absorbing carbon dioxide from the atmosphere is estimated to be 4 million tonnes of carbon dioxide annually, or about 6% of total greenhouse gas emissions. Forests also provide habitat for a great variety of biodiversity, have major impacts on soils, and play an important role in catchment hydrology, and impact on the landscape.

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[14] A public good is a good that is non-rivalous and non-excludable. Non-rivalous means that consumption of the good by one individual does not reduce availability of the good for consumption by others; and non-excludability that no one can be effectively excluded from using the good.

[15] Based on an adult population of 3 million and six visits annually as was found in the Great Britain Day Survey of 6,600 people. A value of €5.40 per visit was used based on survey data.

Native woodlands represent a key part of Ireland's biodiversity and natural heritage, and deliver a wealth of eco-system services. (Photo: K.Collins)

A suite of environmental guidelines to address biodiversity, water quality, archaeology and landscape issues within forests and to guide harvesting and aerial fertilization were introduced mainly in 2000. These guidelines are to be updated by the Forest Service. Compliance is required as a condition of planting approvals, grant aid and licences/approvals. More recently the Forest Service introduced guidelines dealing with the Freshwater Pearl Mussel (2008), Kerry Slug (2009) and Otter (2009).

The approval process for afforestation now includes statutory consultation with certain prescribed bodies including Local Authorities; Inland Fisheries Ireland; the Environment Protection Agency (EPA); Department of the Environment, Community and Local Government; Department of Arts, Heritage and the Gaeltacht, Fáilte Ireland and An Taisce, along with public consultation in certain circumstances.

EIA applies where there is potential for significant environmental impact, such as when project size for afforestation exceeds 50 ha or where the proposed development is adjudged to have the potential to have a significant environmental impact due to site sensitivity or where cumulative impacts from this and other projects may have an impact. Recent legislation[16] and guidance has clarified that EIA is required for land drainage works or land restructuring that potentially impact on the environment.

Environmental objectives have been established for all groundwater and surface water bodies in Ireland in the River Basin Management Plans[17] which were adopted and published by Local Authorities in 2010 in compliance with the EU Water Framework Directive (WFD). The forestry sector in Ireland has been identified as one of eight key pressures on water bodies defined by the WFD. The assessment of potential impact from forests and forestry operations and identification of appropriate measures was assigned to the Western River Basin District (Western RBD) by the National Technical Coordination Working Group as part of an overall National Programmes of Measures studies. An expert group ('Forest and Water Group') including representatives from Coillte, COFORD, the Forest Service, environmental authorities and fisheries authorities recommended a range of forest management measures to ensure that forestry activities do not compromise the environmental objectives established for water bodies (Western RBD, 2008).

Whilst the protection of and access to archaeological sites and monuments, protected structures, and other cultural heritage features are not strictly public goods arising directly from forestry, the provision of these services through the public ownership and open forest policy on the Coillte forest estate could be considered as indirectly provided public goods.

Policy Considerations

In 2001, the European Commission produced non-mandatory guidance on the undertaking and review of assessments as required by the Habitats Directive. The Department of the Environment, Heritage and Local Government (DoEHLG) has published guidance (DoEHLG, 2009) which outlines four stages to complete the AA procedure, with the outcome at each successive stage determining whether a further stage is required. The Forest Service Appropriate Assessment procedures for forestry activities, which were issued in March 2012 (Forest Service, 2012) encompass forestry plans or projects including applications under the Afforestation Scheme, the Forest Environmental Protection Scheme (FEPS) which is limited to REPS farmers, the Native Woodland Scheme (Element 1 and Element 2) and the Forest Road Scheme, and also felling licence applications, aerial fertilisation licence applications and applications for consent without grant aid for afforestation or forest road construction under S.I. 558 of 2010.

The main environmental guidelines are in place since 2000 and were originally intended to be reviewed after five years. In the interim, our knowledge and understanding of the potential impacts of forestry (afforestation, reforestation and forest management) on the environment has improved and the regulatory framework has changed e.g. transposition of the Water Framework Directive. There is a compelling need to update the 2000 series of guidelines and the Code of Best Forest Practice to reflect the changed regulatory framework and to bring together under a single protocol all environmental, biodiversity and best practice compliance requirements.

Compliance with environmental regulations is becoming increasingly complex and can be daunting to new entrants and existing forest owners alike. There is a need for a more integrated approach which would bring together the various bodies, guidelines and procedures and allow for clarity of purpose and provide a transparent basis for decision making.

The use to date of GIS has been limited in the evaluation of environmental impacts of forestry either existing or planned. The inclusion in iFORIS of layers for NPWS consultation zones, archaeology, landscape designation, EPA river data set etc is a welcome and progressive development. iFORIS use in collaboration with the recent IFS from the Forest Service would support a more robust and scientific approach to any mitigation measures and the avoidance of environmental damage by forestry.

[16] S.I. No. 456 of 2011 European Communities (Environmental Impact Assessment) (Agriculture) regulations 2011
[17] http://www.wfdireland.ie/

There are areas, principally within the Coillte estate, which in hindsight should never have been planted. Many of these areas have either been clearfelled or are approaching clearfell age. To reforest these areas in a similar manner as they were planted originally would only serve to continue the process of environmental degradation as their continuation under forestry may not the best use of these areas. The management options are limited to (a) harvest the forest crop and allow nature take its course with minimal intervention, (b) leave these areas untouched and again allow nature take its course over time, (c) harvest the crop and undertake replanting with minimal disturbance and more appropriate species or (d) harvest the forest crop and convert the area to its former state.

The Water Framework Directive (WFD) is a policy driver that necessitates governments, stakeholders and analysts to understand the implications of land use on catchments and water bodies, water allocation policies and develop the tools needed for applied economic analysis. The policy goal is good ecological status of surface water by 2015. The key pressures on WFD defined water bodies from forestry include phosphorus, sedimentation, acidification and dangerous substances. To identify the most appropriate forestry measures there is a need for co-operation between COFORD, Coillte, the Environmental Protection Agency (EPA), DoAHG (Department of Arts, Heritage and Gaeltacht), Department of Environment, Community and Local Government (DoECLG), the Forest Service, non-governmental organisations (NGOs) and associated researchers to help extract and gather information on effectiveness of measures and their costs. The forestry sector has shown an ability to meet new environmental challenges and will need to act responsibly and to continuously respond to environmental challenges in line with best environmental practices.

The archaeological features located in the Coillte estate are a significant part of the national heritage. There are estimated to be some 1,600 Recorded Monuments and Protected Structures, along with many thousands of other cultural heritage features and structures, on the Coillte estate. This is more than double the number of National Monuments in direct State or Local Authority ownership or guardianship. The upgrading and maintenance of a wide network of trails and recreation sites by Coillte, coupled with the incorporation of many of these monuments, structures, and cultural heritage features into sign-posted walking routes by both Coillte and other local tourism groups, has greatly enhanced the awareness and accessibility of the sites as well as the economic value of the recreational/tourism product available in a number of locations. Similar opportunities, subject to careful planning and management, may be available to some owners within the private forest estate.

The Cost Benefit Analysis (CBA) of the planned afforestation demonstrates that the environmental benefits due to carbon sequestration/climate mitigation could outweigh the value of the roundwood produced (Appendix 6). It will be important therefore to ensure that the non-marketable benefits are realised and that there are measures in place to monitor their delivery at a national level.

Policy Statement

To ensure that afforestation, management of existing forests and development of the forest sector are undertaken in a manner that ensures compliance with environmental requirements and objectives and enhances their contribution to the environment and their capacity for the provision of public goods and services.

Strategic Actions

3.1 The value of the complete range of non wood benefits to be quantified and included in a revised Cost Benefit Analysis of the planned afforestation programme.

3.2 All relevant proposed EU regulations, EU Directives and national legislation should be subject to full stakeholder consultation and Regulatory Impact Assessment as per RIA guidelines.

3.3 DAFM in collaboration with the main sector stakeholders to update the complete set of environmental guidelines[18] with priority given to guidelines that address water quality, fertilisation and biodiversity. In the revision consideration should be given to structuring the guidelines so they can be used either at forest developmental stages (establishment, thinning, harvesting) or thematically to deal with water, biodiversity etc. The revised guidelines should be comprehensive, provide clarity regarding requirements including buffer zones as appropriate, permit procedures and facilitate compliance of forestry activities with the overall environmental regulatory framework including *inter alia* the Water Framework Directive (including high status waters), the EIA Directive, the Birds Directive and the Habitats Directive.

[18] Grant-aid is conditional on compliance with Forest Service guidelines.

3.4 DAFM to update the Code of Best Forest Practice and the National Forest Standard to reflect changes in the suite of environmental guidelines, changes in best practice, changes in the regulatory and compliance framework and as a means to support compliance with the principles of sustainable forest management and the ecosystem approach as elaborated in the 2008 MCPFE (now Forest Europe)/PEBLDS jointly adopted Pan-European Guidelines for Afforestation and Reforestation.

3.5 The Irish National Forest Standard will be used as the basis for reporting on the state of Ireland's forests and on sustainable forest management.

3.6 DAFM, in collaboration with DoECLG, the NPWS and statutory bodies to develop a guidance document outlining the nature and use of current environmental and best practice compliance requirements.

3.7 Training will be provided to Forestry Inspectors in the first instance; and its rollout to forestry practitioners will be considered as appropriate, to enable the assessment of habitat types in afforestation proposals.

3.8 Procedures to be developed by DAFM for Approvals/Consents and Licences for afforestation, forest road construction and harvesting to ensure that all applications in and adjacent to Natura 2000 sites are subject to an appropriate assessment procedure.

3.9 Initiatives and measures which aim to enhance provision of recreation/tourism and landscape benefits from forests will be supported.

3.10 Based on the findings of a Working Group to be established by DAFM in collaboration with Coillte and relevant stakeholders, introduce guidance and criteria for the identification and future management of peat areas currently afforested which are to be deforested to mitigate continued environmental degradation. The Working Group will also provide clear guidance on future afforestation of peat soils.

3.11 Facilitate the cost-benefit analysis process for identifying the most cost-effective measures for compliance with the Water Framework Directive.

3.12 Initiatives and measures which aim to enhance the water and wetlands benefits of forests will be considered under the Native Woodland Establishment Scheme.

4. Supply Chain

Current Features

Coillte currently supplies 85% of the harvested roundwood (COFORD 2011) through its fortnightly electronic auction system and this dominant supply position will continue until further increases in supply become available from the private sector.

Coillte harvests approximately half of the volume it produces, mainly from thinnings and sells the balance standing, and is currently examining these proportions as part of its review of its overall sales system. Almost all harvesting is undertaken by private sector forest contractors who are equipped with modern harvesters and forwarders. Harvesting and transport are significant cost elements of timber procurement by the processing and wood energy sector especially for small-sized material from thinnings. There is a lack of harvesting capacity to undertake the forecast level of thinnings in the private sector and an assessment of future harvesting machine requirements has not been undertaken. There is a lack of funding and training facilities for harvesting machine operatives (Tarleton 2009 and Tarleton 2011).

The OptiLog report (Tarleton and Phillips, 2004) examined the cost structure of the timber supply chain and presented strategies for its configuration in order to improve efficiency and reduce cost.

Coillte operates a docket based automatic weighbridge system, the Northern Ireland Forest Service operates its own timber permit system and the Irish Timber Growers Association (ITGA) has developed a pre-texting and permit system suited to private owners.

Teagasc has developed a methodology to identify viable clusters of private plantations whose owners could collaborate to provide economies of scale in the sale and harvesting of roundwood. However ongoing support will be needed to enhance owner's capacity to collaborate.

The use of minor county roads to transport roundwood continues to be an issue with some Local Authorities as roads are subjected to levels of traffic for which they were not designed or upgraded notwithstanding the national commitment to forestry. There is no national system for the recording of weight restrictions on county roads and practices vary between Local Authorities.

The COFORD Roundwood Demand Group estimates that the demand for wood fibre for energy will increase by 1.7 million cubic metres between now and 2020, in a scenario that assumes significant expansion of the purpose-grown energy crop area and a substantial level of imported biomass. Roundwood production from Irish forests is estimated to almost double to 7.38 million cubic metres between 2011 and 2028 with almost all of the increase forecast to come from the private sector (COFORD 2011).

Policy Considerations

The forecast area for thinning is estimated to double to 50,000 ha per annum by 2022, with the largest increase being in the private sector. The scale of first thinning in the private sector is forecast to average circa 6,000 ha per annum over the next decade (excluding backlogs). Unless these first thinnings are undertaken, second and subsequent thinnings will not be possible. The harvesting capacity for first and second thinnings is limited and unlikely to expand given the current lack of finance and lack of economies of scale in the private forest estate. Some form of incentive will be necessary to leverage private sector supplies.

If the harvesting capacity is to expand in line with the forecast increase in roundwood production, then not only will additional machine capacity be needed but also trained operatives capable of working at high levels of efficiency. Lack of funding and training facilities could result in less than efficient harvesting, with knock-on impacts on costs and overall industry competitiveness.

Timber mobilisation will play an increasing priority role, if forecasts of roundwood production, especially from the private sector, are to be achieved. National and regional mobilisation strategies will need to be developed to improve co-ordination, inform industry and support forest owners.

In recent times a number of harvesting contractors have either exited the sector, moved operations to mainland Europe or scaled-back capacity. Current infrastructure capacity and the age of machines are unknown. While Coillte maintains a database of its harvesting contractors (information on personnel, felling harvesting and transport capacity, machine type and age), there is no national information on capacities for thinning, clearfell, wood energy harvesting or transport. Such information is necessary if the sector is to plan how it will access the increasing volume of thinnings and increase supply to the sawmilling, wood panel and wood energy sectors.

The OptiLog report put forward a series of incremental strategic actions to reconfigure the wood supply chain. The current supply chain has been developed to suit the needs of Coillte and may not be applicable to the large

Forwarder extraction of clearfell roundwood assortments

numbers of private growers with relatively small harvesting volumes. Reduced supply-chain costs coupled with enhanced product recovery and value added initiatives will increase competitiveness and also the forest sectors wood paying capability.

Ireland is a small producer of sawnwood within the EU, and due to its relatively high cost base will find it difficult to compete with large volume producers in markets for commodity type products.

Coillte has an extensive forest road network of circa 8,000 km. Enabling private forests to deliver on roundwood supply and recreation requires that access to plantations is provided in an efficient manner. Given the location of many private forests relative to Coillte properties there are potential synergies which could be exploited.

Policy Statement

To further develop an efficient, sustainable and environmentally responsible supply chain that is compatible with forecast volumes, which will enhance the competiveness of the processing sector and its wood paying capacity to forest owners.

Strategic Actions

4.1 In consultation with stakeholders, DAFM will develop a National Roundwood Mobilisation Strategy to implement improved efficiency and logistics along the supply chain from grower to final end user, bearing in mind the increased volumes that will now come from the private sector; and taking account of best international practice.

4.2 Carry out a national survey of current harvesting and transport infrastructure capacity and identify the future capacity requirement in line with the forecast volumes and the increased thinning volumes from the private sector.

4.3 DAFM to commission a desk study to review the practice and consequence of licensing / permitting of harvesting contractors in other European countries to determine whether such systems have any application under Irish conditions.

4.4 DAFM should initiate discussions with Coillte and other forest owners to develop a framework to allow shared use of forest roads for forest operations (see also 12.3).

4.5 DAFM, in partnership with grower representative organisations, Coillte and the forest industry, should facilitate the development of a standard system for timber measurement and removals.

4.6 DAFM to investigate measures which will support the phased development of the harvesting infrastructure.

4.7 DAFM will support measures that encourage collaborative actions to improve economies of scale among forest owners.

4.8 Support the evaluation and testing of small scale harvesting equipment for the thinning of privately owned forests.

4.9 Support measures, initiatives and awareness-raising aimed at achieving good practice in roundwood haulage.

4.10 In consultation with stakeholders, provide support measures and initiatives to identify the most suitable roundwood transport routes and their co-ordination with Local Authorities.

4.11 Support measures to optimise the environmentally efficient and sustainable recovery of harvesting residues for energy.

5. Wood Processing and Wood-Based Panels Sector

Current Features

The wood processing sector of the forest industry comprises four broad categories – primary (sawmilling), secondary (panels), tertiary (furniture and wood craft) and wood energy.

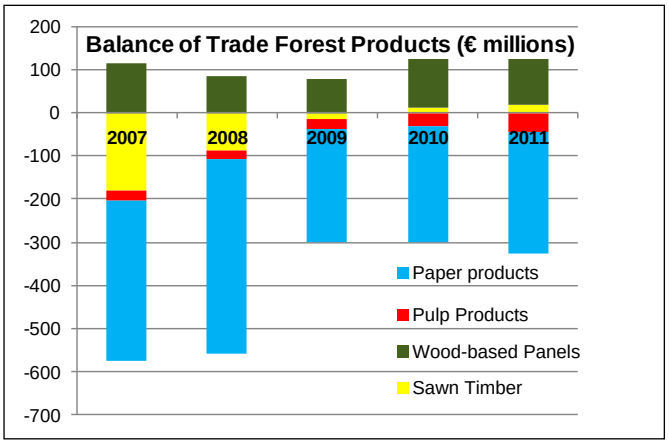
The sawmilling sector encompasses a large number of relatively small sawmills and a small number of medium to large sized mills with an estimated 75% of all roundwood being processed by the five largest sawmills.

The primary products include construction timber, pallet and fencing products. Sawn timber exports comprise mainly pallet and fencing products.

There are three wood based panels (WBP) plants in the ROI[19]:

1. Smart*Ply* Europe Limited in Co Kilkenny manufactures Oriented Strand Board (OSB) with a product production capacity of circa 330,000 cubic metres per annum. In 2002 Coillte took over full ownership of the company;
2. Medite Europe Limited in Co Tipperary manufactures Medium Density Fibreboard (MDF) with a product production capacity of circa 440,000 cubic metres per annum. Coillte purchased the plant in 2008;
3. Masonite in Co Leitrim produces moulded fibreboard door facings with a production capacity of circa 200,000 cubic metres roundwood equivalent.

These companies employ circa 500 people directly in well paid, skilled employment in rural locations and approximately the same again indirectly in harvesting, log haulage, maintenance, freight and other services.



The WBP sector provides a secure, non-subsidised long term outlet for pulpwood from thinnings and for sawmill residues and consumes in excess of 1.3 million cubic metres of wood fibre per annum.

The WBP sector is a key player in adding value to Irish wood fibre and in driving Irish exports with 84% or 616,000cubic metres of WBP being exported in 2011 (Knaggs and O'Driscoll, 2012a) with the key markets being the UK and the Benelux countries. Ireland is the largest exporter of MDF to the UK marketplace.

Irish timber processors and panel manufacturers have developed innovative new products, such as eased-edge structural timber by the Murray Timber Group and the development of Smart*Ply* SiteProtect by Coillte Panel Products (CPP).

Since 2007 the trend has been for Ireland to become a net exporter of sawn timber, due largely to the collapse of the domestic construction market and increased levels of exports to the UK. In 2011, sawmills processed 1.7 million cubic metres of roundwood, generating 0.76 million cubic metres of sawn timber. While the domestic sawn timber market declined by 53% over the period 2008-2011, sawn timber exports grew by 60% (Knaggs and O'Driscoll, 2012a).

The furniture and joinery sub-sector is widely dispersed with almost 300 firms, the vast majority of which are relatively small, employing less than ten people and a few medium-sized enterprises. The timber used is mainly imported, especially hardwood species.

The wood energy subsector is relatively young. Wood biomass use has increased from an estimated 0.73 million cubic metres in 2008 to 0.966 million cubic metres in 2011(Knaggs and O'Driscoll 2012). There are two wood-fuelled combined heat and power (CHP) plants operated by Grainger Sawmills Ltd and Munster Joinery Ltd. Two wood pellet facilities have recently begun production in counties Kilkenny and Laois.

Edenderry Power, a peat-burning power station operated by Bord Na Móna is currently working to increase its intake of wood biomass from the 62,000 tonnes of woodchip and sawdust and 6,000 tonnes of wood pellets used in 2009.

The COFORD Roundwood Demand Group estimates that the demand for wood fibre for energy will increase by 1.7 million cubic metres between 2010 and 2020, in a scenario that assumes significant expansion of the indigenous purpose-grown energy crop area and a substantial level of imported biomass.

[19] Finsa Forest Products in Co Clare with a production capacity of 120,000 m^3 no longer uses roundwood but finishes imported board from Spain. It is a subsidiary of the Spanish company Financiera Maderera SA (FINSA).

Forest products, Woodfab, Aughrim, Co Wicklow

Policy Considerations

Current indications are that oil and other fossil fuels will increase in scarcity and price over the coming decades. Ireland's policy as elaborated in the Energy White Paper 2007 is to develop secure sources of renewable energy up to 2020 and beyond. Wood fibre, whether derived as a by-product from timber processing or as roundwood harvested from the forest, has a distinct role to play in addressing these policy drivers.

In response to the long-term forecasts of fossil fuel availability there are concerted moves to develop a European Bioeconomy for the sustainable production and conversion of biomass into a range of food, health, fibre and industrial products and energy (BECOTEPS 2011). These developments, including small-scale bio refineries, are likely to have an increasing impact on biomass and wood flow dynamics over the coming decade and may offer business opportunities for the forest sector in Ireland.

There is overcapacity in the sawmilling sector which has led to record prices being paid in early 2010 for the limited volumes reaching the market. Some mills have had to source logs from Scotland, but this may not represent a viable option in the medium term. Additional supplies of sawable sized material from the private sector will take some years before they reach the market. Some rationalisation is probably inevitable, however it is a matter for the industry itself and not something which DAFM could become involved in.

The All-Ireland Forecast 2011-2028 highlighted the gap between forecast volume and the actual volume harvested. Roundwood forecasts will need to improve in terms of providing quality information on net realisable volumes and product classes.

Security of supply is essential to ensure that the wood processing sector continues to develop and that the wood energy sector delivers on the targets for renewable energy. Already there is an anticipated imbalance between future projected biomass demand and supply of 1.7 million cubic metres by 2020. Key to future supply will be a continuation by Coillte to bring to market the volumes, species and assortments indicated in its Forecast 2011 and co-ordination of initiatives to leverage supplies from the private sector on a sustainable basis.

The wood industry sector has to a large extent operated independently of the growing sector. The Irish Timber Council (ITC), the representative organisation for sawmillers, has been less active in recent years. The Irish Forestry and Forest Products Association (IFFPA) has been established "to provide a strong united voice for the entire forestry and forest product industry chain". The wood processing sector operates much closer to markets and has a more informed view as to what products, species, sizes and raw material quality standards are required in the future, but has had little input to decisions around species and timber quality.

The State has actively encouraged the planting of broadleaf tree species through a combination of grant aid and higher premium payments. The tending of this emerging resource is essential, if in the longer term there is to be an increasing and sustainable supply of quality logs for the wood industry to process. Early thinnings will not yield material of sufficient size to be used for conventional processing although there has been on-going development in technologies for the use of smaller-sized hardwood material using re-engineered wood technologies. Material from cleanings and early thinnings are suited for conversion to firewood and other wood fuels e.g. charcoal or wood pellets. Other possibilities include handcrafts.

Coillte is the dominant supplier of logs to the processing sector which it sells through its timber sales electronic auctioning system. Currently Coillte sells approximately half of its timber standing and the other half harvested. In addition, Coillte supplies about 100,000 cubic metres annually through a local sales system to smaller users and specialist end markets. The electronic timber sales system was introduced in 1997. The processing sector has concerns regarding the appropriateness of the timber sales system in its current format to meet the future needs of the sector. In Sweden, Sveaskog, the State Forest Enterprise sells up to two thirds of its volumes through long-term contracts which are typically one year rolling contracts. In Estonia, the State Forest Company (Esti Metz) uses long term supply contracts of up to five years with negotiated minimum annual volumes.

Any increase in domestic production from the sawmilling and WBP sectors will have to be exported as the domestic market is limited. Competitiveness and adding value will be key in maintaining existing and in securing further export markets. Rising input costs will need to be controlled and increased efficiencies put in place.

Wood fibre, given the limited supply and competing markets, when used for energy production, should be directed where the maximum efficiency in conversion to energy can be gained. CHP and heat only plants (including commercial scale boilers) have usage efficiencies of greater than 80%. Co-fired peat and/or coal fired power stations have much lower efficiencies of the order of 35%. However, for an emerging industry, the benefits of a large single demand source on mobilising biomass and stimulating the development of efficient supply chains is an important consideration. A number of large users of biomass (CHP and co-firing) can facilitate the development of efficient supply chains.

There is potential to reduce reliance on imported hardwoods through the use of advances made in the processing of small diameter hardwoods (14 to 30 cm) logs and in the development of innovative uses for small sized sawn hardwoods.

Policy Statement

To support the development of a competitive, innovative, value-added and market focused wood processing sector which provides sustainable solutions to a diverse portfolio of users in the construction, lifestyle, renewable energy, furniture and related markets.

Strategic Actions

5.1 DAFM to facilitate a review of the wood processing and wood based panels sector with a view to improving long term sustainable roundwood supply from both the private sector and Coillte and identifying areas where collaboration can contribute to realising increased levels of supply from the private sector.

5.2 State agencies including Enterprise Ireland will support initiatives to add value, including niche markets, to the current range of timber products being processed and to the development of new and innovative products, including biofuels, which can be manufactured from existing and future raw materials.

5.3 State agencies will support measures aimed at forest product market identification and exploitation including markets and uses for small diameter hardwoods.

5.4 DAFM will facilitate projects and measures which lead to the development of more reliable forecasting tools and methodologies.

5.5 DAFM will give consideration to support for the supply of quality and added value fuels from the tending of broadleaved species, especially where this involves locally organised producer groups.

5.6 DAFM, in collaboration with Enterprise Ireland, SEAI and sector stakeholders to monitor the balance between forecast supply and demand across the wood energy, wood based panels and sawmilling sectors.

6. Forest Protection and Health

Current Position

Ireland's forests are subject to a variety of threats from pests and diseases. Some of the most serious problems arise from invasive alien species (IAS), foremost of which are several species of deer, grey squirrel and several introduced shrubs and herbaceous plants. Among the most problematic IAS is *Rhododendron ponticum*, which spreads readily by seed and forms dense, impenetrable thickets, especially in the west where it causes serious damage to native oak woodlands and other habitats, e.g. bogs. Laurel (*Prunus laurocerasus*) and Japanese knotweed (*Fallopia japonica*) and Himalayan knotweed (*Persicaria wallichii*) can also be a serious weed problem and numerous other broadleaved shrubs are increasingly seeding into forests, perhaps in response to climate change.

Rhododendron is also a sporulating host of the fungus pathogen *Phytophthora ramorum* a serious disease subject to EU wide regulatory control which has recently caused the death of Japanese larch on a number of sites in the eastern, south eastern and southern parts of the country. P. ramorum has the potential to spread to other forest tree species in association with infected Japanese larch and rhododendron and has been found on a number of other tree species, e.g. beech, Spanish chestnut, noble fir and a single specimen of Sitka spruce.

There is substantial evidence to suggest that deer populations of all species in Ireland have expanded in recent times and are now perceived to be at unsustainable levels in some localities and have the potential to adversely impact on the economic and environmental benefits of forestry (Inter Agency Deer Management Working Group, 2010). A report commissioned by Woodlands of Ireland (Purser et al. 2009) called for a co-ordinated national deer management strategy encompassing the 32 counties of Ireland.

Muntjac deer (*Muntiacus reevesi*) which is native to southeast China and Taiwan is thought to have been introduced in about 2006 most likely from Britain. It can become a major pest. Sightings been recorded from a number of counties but their distribution is as yet unknown.

There has been a heavy reliance on deer fencing as a means of protection and while it will provide short-term protection from browsing, it does not address the fundamental issues of deer abundance and damage.

Serious damage is being done to broadleaf trees, notably beech, sycamore and oak by grey squirrels through bark stripping. Native red squirrels can rarely co-exist and survive in the presence of a large grey squirrel population (Carey 2008).

In comparison with mainland Europe, forest fires represent a relatively low risk. Nevertheless, the incidence of forest fires has increased in recent years with most fires entering forests from adjoining land. Damage due to wind and catastrophic windthrow following storms is a higher risk.

Ireland's island status, the relative newness of the forest estate and the enforcement of plant health regulations have enabled us to remain free of many of the major European forest diseases and pests. However, with growing globalisation of the economy and the increase in air travel and tourism, maintaining Ireland's relatively healthy forest status is increasingly challenging.

All forests are at risk from introduced harmful pests and diseases. The recent outbreak of *P. ramorum* on Japanese larch is a cause for major concern. Other recent disease findings include *P. lateralis* on Lawson cypress and *P. kernoviae* on rhododendron (in several cases in conjunction with *P. ramorum*). There are numerous other threats from both regulated and non-regulated pests and diseases including non-European *Scolytidae*, non-European *Pissodes*, Emerald ash borer (*Agrilus planipennis*), Asian longhorn beetle (*Anoplophora glabripennis*), citrus longhorn beetle (*A. chinensis*), and new and emerging threats such as ash dieback caused by *Chalara fraxinea / Hymenoscyphus pseudoalbidus* in ash and oak moth (*Thaumetopoea processionae*), many of which could cause significant problems in Ireland. The introduction of pine wood nematode into Portugal, which has recently spread to Spain, demonstrates the significant damage that can be caused to forests by introduced pests including the resulting significant impacts on the forest industry.

The Forest Service is responsible for implementing the forestry aspects of the EU Plant Health Directive. Legislation and regulatory controls are in place in relation to the movement of wood, wood products and forest plants from within and outside the EU to prevent the entry of exotic pests and diseases. Border inspection posts are in place where import inspections are carried out to ensure compliance with the EU Plant Health Directive. A particular high risk pathway for the entry of harmful pests is wood packaging material associated with the transport of goods of all kinds. In this regard, all imports of pallets, crates, etc, must be treated and stamped in compliance with ISPM No. 15, an international standard which regulates wood packaging in use in international trade to prevent the introduction and spread of forest pests. The Forest Service is also responsible for systems to ensure that exports from Ireland to non EU countries are compliant with ISPM 15.

In 2002, the Forest Service introduced Forest Protection Guidelines covering the most significant issues

(Forest Service, 2002). Compliance is a condition of planting approvals, grant aid and activities associated with a felling licence.

Invasive non-native plant and animal species are the second greatest threat to biodiversity worldwide after habitat destruction. In March 2004, the *Invasive Species in Ireland* report was published. Subsequently, Invasive Species Ireland, a joint initiative between the Northern Ireland Environment Agency and the National Parks and Wildlife Service, was established to work together and with others to tackle the invasive species problem on an all-island basis. Guidance has been produced on the control of a number of invasive species including rhododendron (Maguire et al. 2008 and Barron 2009).

Intensive and extensive forest ecosystem monitoring has been ongoing in Ireland for more than twenty years. Results show that Ireland's forests are among the most healthy, vital and productive in the European Union. The main influence on forest health over this period has been abiotic in nature but episodic biological outbreaks such as insect damage can be significant and persistent.

Intensive monitoring of forest ecosystems has shown a significant reduction in the deposition of acidifying compounds of sulphur to Irish forests over the past twenty years. (In the past much of the forest cover in Ireland was located on thin acid-sensitive soils with a low base cation status.) The reduction in sulphur deposition is also observed in throughfall (rainfall measured beneath the forest canopy), and both the pH of the precipitation and the throughfall have also increased (become less acidic) over the same period.

While sulphur concentrations have decreased in humus and soil waters of Irish forests, humus waters show no increase in pH over the same period. Concentrations of aluminium measured in soil waters of Irish forests have also decreased suggesting an improvement in forest soil condition and a return to base cation leaching status.

Significantly, while sulphur has decreased there has been no reduction in the emission of oxides of nitrogen and ammonia in the same period implying a slow and chronic deposition of nitrogen to Irish forest ecosystems. Nitrogen levels remain low in the west but may be locally high in areas such as the east coast and close to Dublin.

More recently the forest ecosystem monitoring programme has become more closely integrated with the National Forest Inventory network, and this development is expected to continue (see recommendation 2.13).

Detailed studies of forest soils at the monitoring plots, in combination with deposition and nutrient turnover rates, may be used to better understand contemporary forest management practices such as quantitative accounting of realistic scenarios of increased recovery of forest residues for renewable sources of energy.

Under the EU Plant Health Directive the Forest Service maintains a national network of observation points to monitor for harmful pests and diseases. These observation points where appropriate incorporate insect bait, log and pheromone traps.

Long term monitoring of Irish forest ecosystems is providing critical baseline empirical data on ecosystem processes in forests. These regulate forest productivity and long term sustainability. In an environment of changing climate, emerging pests and diseases, increasing stakeholder and regulatory demands, the need to continue long term monitoring is obvious.

Policy Considerations

Forests are at risk from a range of abiotic and biotic factors including climate change, fire, wind, and pests and diseases. Many of these risks are predicted to increase due to climate change (EFI, 2011). More diverse forests, in terms of age and compositional structure, can help to mitigate these risks. Currently each risk is treated separately and actions taken as and when required. Risks, if known in advance can be managed and their impact mitigated. This is especially important in view of the State investment in afforestation in the expectation that the full range of benefits would be provided. There is no requirement to include an overall risk assessment as part of the forest management plan or to identify suitable mitigation measures.

Professional culling of deer populations requires baseline data to be routinely collected and used as a basis for strategic planning and resource allocation for appropriate deer management efforts. Deer populations require management as a resource, and not elimination as a pest species. Sustainable forest management includes good deer management. Matters are not helped by the lack of a single point of responsibility for co-ordination of activities in relation to deer management.

Control of rhododendron (and to a lesser extent laurel) is difficult and expensive and requires a combination of chemical and mechanical means. It is often prohibitively costly for private landowners. Recently developed control methods have greatly improved efficacy and reduced costs (e.g. Barron Undated)[20] but control is often frustrated by seed blowing in from adjacent land. Control of rhododendron is also a major factor in the management of *P. ramorum* as is the illegal harvesting of rhododendron foliage for which there is evidence that the practice is

[20] Barron, C. (Undated) The control of Rhododendron in native woodlands. Native Woodland Scheme Information Note No. 3. Forest Service. Dublin.

Scots pine plantation (Photo: K.Collins)

resulting in the spread of the disease with a corresponding risk to forest tree species. Other species also need to be controlled before they become too serious a problem. Grant aid for the control of IAS is available under the Native Woodland Scheme for native woodlands but it does not extend beyond the confines of the woodland.

Under new regulations (the European Communities (Birds and Natural Habitats) Regulations 2011 Statutory Instrument 477 of 2011) rhododendron and several other plant species are listed as non-native species subject to restrictions. As such, it is an offence to plant or disperse them or allow them to be dispersed and their exclusion, eradication or control may be legally required where they pose a threat to the objectives of the Birds and Habitats Directives.

The control of the large pine weevil (*Hylobius abietis*) which is a major pest of reforestation sites currently relies heavily on chemical control measures. The continued use of chemicals may not be feasible or desirable. Other measures such as fallowing, use of nematodes, and biodegradable collars afford some protection but are not as effective.

It is clear from the policy and scientific analysis that invasive alien (non-native) species can have serious economic and ecological impacts. Both the *Irish National Biodiversity Plan* and the Northern Ireland *Biodiversity Strategy* formally recognise invasive non-native species as a significant threat to biodiversity. While non-native species can bring significant economic and amenity benefits, there is a growing recognition at international, EU and at an all-island level that existing controls are insufficient to respond to the ecological, economic and cultural threats posed by invasive alien species (Turner, 2008).

Policy Statement

To maintain a healthy forest environment through sustainable forest management and early detection and control measures to prevent the introduction and spread of harmful invasive alien species, pests and diseases.

Strategic Actions

6.1 A full-time National Deer Management Unit (NDMU) to be established within DAFM to coordinate deer management policy development and implementation, in consultation with stakeholders, and to lead the development of a professional deer management culture in Ireland.

6.2 The NDMU to undertake a national census of deer population distribution and density and based on this to develop an appropriate culling regime in the context of a national strategy for deer management, particularly in forest areas.

6.3 DAFM to update the format for the forest management plan to include an overall risk assessment (biotic and abiotic) and identification of appropriate mitigation and prevention measures.

6.4 The Forest Protection Guidelines and Forestry Schemes Manual to be updated in light of new and emerging threats to forests and supported where appropriate with public awareness campaigns and information targeted at forest owners, landowners and the general public.

6.5 The current forest fire warning risk assessment carried out by the Meteorological Office should be supported. DAFM in collaboration with the Local Authorities and relevant stakeholders to put in place guidance, in order to increase awareness and reduce the risk of forest fires, which would facilitate a co-ordinated system of fire plans (including dealing with fire outbreaks) for forest plantations and implement by 2014 the recommendations of the Land and Forest Fires Working Group.

6.6 The use of species and provenances with proven disease resistance to be favoured in grant-aided afforestation and encouraged in all planting.

6.7 DAFM to continue to identify and analyse forest pest and disease risks from abroad and to maintain monitoring, biosecurity and phytosanitary measures to reduce the risk of entry and establishment of harmful non-native pests, diseases and invasive alien species and, depending on impending threats, consider the establishment of a Biosecurity Taskforce.

6.8 DAFM/COFORD to implement a decision support system (DSS) to facilitate the selection and planting of most appropriate species in the light of the potential impact of climate change and to guide the forest industry accordingly.

6.9 DAFM/COFORD to consider support of field scale evaluation of non-chemical measures including nematodes, and silvicultural practices and following this indicate appropriate measures for the control of the large pine weevil.

6.10 DAFM to co-ordinate efforts across the forest sector to collaborate with the NPWS and other organisations in the early identification and control of invasive alien species which represent a threat to forest biodiversity and economic development.

6.11 In the light of the new regulations (SI 477 of 2011), DAFM to consider providing support for the control of rhododendron and other IAS in all forests and on lands adjacent to forests which act as a seed source. Where appropriate, support for control should be considered under the new CAP reform measures.

6.12 DAFM should evaluate the option of licensing the cutting and use of rhododendron for decorative purposes, especially in the area of 'proof of origin'.

7. Support – Education, Training and Research

Current Position

Degree courses in forestry are provided by University College Dublin (UCD) and the Waterford Institute of Technology (WIT). The Galway Mayo Institute of Technology (GMIT) closed its forestry degree course in 2010.

Teagasc offers a 2-year course leading to a Further Education and Training Award Council (FETAC) Vocational Certificate in Forestry together with a series of short courses on various aspects of forestry and forest management targeted at farm forest owners. Teagasc runs a programme of adult training and practical learning, directed largely at farm forest owners. The focus is to build forestry knowledge and capacity amongst owners. Teagasc also runs skills courses such as timber measurement.

In 2007, Forestry Training and Education in Ireland (FTEI) was established as a limited company to advance training and education in forestry in all its aspects, to encourage the study of forestry training and education and to maintain and improve standards of work practices in forestry. FTEI has a wide remit, including the longer term, strategic planning of forestry education and training provision to meet the changing needs of the Irish forest industry (Tarleton 2011).

The Society of Irish Foresters (SIF), the Irish Timber Growers Association (ITGA), the Irish Farmers Association (IFA) and Teagasc collaborate in the organisation of field days, workshops and conferences, addressing topics of interest to forest owners and issues of interest to the sector as a whole. Woodlands of Ireland provide training and awareness in relation to the management of native woodlands, the supply of trees and shrubs and the collection of tree seeds and forest fungi. NPWS funds research on native woodlands and biodiversity. The wood industry sector, while recognising the importance of training in areas such as sales, marketing and technology, has been slow to avail of schemes such as the Skillnets programme. The IFA Skillnet offers courses to farm forest owners in basic chainsaw and tree felling.

A number of State agencies are involved in the funding and conduct of forest research and development, including wood product development. Total expenditure in 2009 was €8.4 million. The COFORD national forest research programme (now administered by the Research Division DAFM) and Enterprise Ireland are funding bodies, while Coillte and Teagasc undertake research projects related to company and national priorities. Business-led investment in research and development, based on the level and rate of grant-aid (30%) from Enterprise Ireland (excluding Coillte) was in the region of €3.5 million in 2009 (Fitzgerald pers. comm. 2010).

Forest research and development investment is circa 0.63% of the total contribution of the sector to the national economy which compares poorly with the national spend which is of the order of 1.68% GNP (Forfás 2009).

The COFORD council continues to address development issues that impinge on the forest sector including wood demand and supply dynamics and related issues.

Policy Considerations

Funding for training has reduced significantly in recent years. A training needs analysis undertaken on behalf of FTEI in 2009 has highlighted the lack of facilities and a projected major shortfall in trained operatives for harvesting. A more recent training needs analysis (Tarleton 2011) highlights (a) a fall of 54% in numbers trained compared with the late 1990s, (b) a reduction of almost 50% in FTEI funding, (c) a demand for training courses exceeding supply and (d) a lack of long-term strategic planning and allocation of funding.

The approach to the provision of education and training across the sector has lacked an overall focus and direction. The introduction of updated codes of practice, management plans and environmental guidelines recommended elsewhere in this report, will require the provision of training support. There is increasing demand, particularly among the emerging forest owner groups for education and training programmes on timber measurement, chainsaw safety, preparing for first thinning and a guide to timber markets. There is a lack of involvement and active participation by the private sector in the provision of support services but especially in relation to education, training and research. This is reflected in the contribution level to research and development which was only 37.5% of the national average in 2009. This was despite all parts of the sector agreeing to a Strategic Research Agenda in 2006 and Ireland becoming a member of the European Forest-Based Sector Technology Platform in 2007. The State, which is still the largest single forest owner, continues to dominate the provision of support services through a range of agencies and bodies.

Most new owners have relied on forestry companies and consultants to establish and maintain their forest. This has lessened the involvement of some owners in forest management, leading in some cases to owners having little knowledge of forest management operations including harvesting and may be unaware of the financial benefits of thinning or other forms of management intervention.

Cable extraction of thinnings used on a steep, sensitive site

While a significant proportion of the current investment in forest research and development is to address policy needs in areas such as water quality, biodiversity and climate change mitigation, areas such as forest management planning and silviculture must also be viewed in the overall context of innovation, which the recent Forfás report, *Innovation Ireland - The Smart Economy Report of the Innovation Taskforce*, elaborated upon.

Some consideration should be given to part-funding forest research directly from the sector. A number of models already exist, such as Skogforsk (the State applied forest research body in Sweden), which derives its income from a roundwood levy.

Given the disperse nature of the forest resource, the need to build on a comparative advantage in growing wood fibre, the relatively high cost base of forest operations, and the need for competiveness along the wood supply chain (including wood energy), allied to the need to grow exports, and to provide a range of public goods, the current annual level of investment of €8.5 million by the State in forest research and allied private-sector investment will need to be at least maintained in real terms over the coming decade.

National forest research competence also needs to be maintained and developed in the programme areas outlined in recent COFORD reports. There is a need to consolidate work in critical forest research areas such as climate change mitigation, forest genetic resources, forest management planning, forest policy and economics, silviculture and wood energy. These areas require continuity of effort and national coordination to provide value for money and a level of expertise to achieve the potential of the forest sector.

DAFM supports access to a series of REPS demonstration farms. These are used for training and demonstration purposes. A similar system does not operate in the forest sector.

Dissemination of research findings through publications, seminars and workshops is vital to enabling research outputs to be taken-up in policy, products and practice. COFORD publications have provided a much-needed source of authoritative information over the past decade and a half. Continuity of investment is required in this area. Teagasc, in collaboration with the private sector, has an important role in advising growers on forest operations, as well as promoting grower groups and initiatives to bring wood to market at competitive rates.

While there has been a strong focus on skills training for forest operatives in the past to ensure competence and compliance with health and safety, this is now under threat due to lack of funding. With the expansion of the forest sector there is a real risk that injury rates will increase dramatically because of the lack of training and competence across the sector as a whole. The Health and Safety Authority (HSA) through the Farm Safety Partnership Advisory Committee (FSPAC) recognises these issues and is concerned that accident rates will increase as more private forests become ready for harvesting and re-establishment.

Policy Statement

To ensure the availability of suitable programmes of education and training across the sector and research programmes targeted at identified needs.

Strategic Actions

7.1 Support measures and initiatives to establish an overarching forest sector body which will guide and co-ordinate activities relating to research and development, training and education across the sector with a focus on innovation, added value and increased competitiveness.

7.2 In order to increase the level of involvement of the forest sector in funding research DAFM will examine the feasibility of the sector part-funding national forest research.

7.3 DAFM will evaluate the findings from the 2011 FTEI training needs analysis for the forest sector and issues raised by the Farm Safety Partnership Advisory Committee and prepare a phased implementation plan to address prioritised needs, including competency based training and certification systems.

7.4 The wood industry in collaboration with IFFPA and Irish Business and Employers Confederation (IBEC) should put in place a training programme, utilising Skillnets and other initiatives as appropriate, to meet the needs of the wood industry.

7.5 Teagasc in collaboration with the HSA and other public bodies to heighten awareness among forest owners of their responsibility regarding employment of contractors and health and safety issues.

7.6 DAFM to consider the possibility of supporting a network of forestry demonstration farms.

7.7 DAFM to maintain, in real terms, the current level of State-led investment in forest research over the coming decade.

7.8 National forest research and development priorities will be established by DAFM in consultation with the membership of COFORD council, other government agencies and stakeholders.

7.9 DAFM, in cooperation with the COFORD council to examine the feasibility of establishing long-term research programmes involving partnerships between State agencies and third level institutions.

7.10 Ensure that ecological and environmental aspects of forestry are adequately covered in education and training courses.

7.11 The COFORD council, in collaboration with forest industry, relevant State agencies and sector stakeholders to undertake a review of the Strategic Research Agenda with a view to prioritising areas for investment in research and development across the sector.

8. Quality, Standards and Certification

Current Position

Ireland has modern health and safety legislation which applies to all industries and places of work and places a duty on employers and the self-employed to manage health and safety in a similar fashion to all other aspects of the business. The Health and Safety Authority (HSA) have developed an *Approved Code of Practice Managing Safety and Health in Forestry Operations*. This transposes many of the requirements and duties from the legislation to a practical code which must be implemented to demonstrate compliance. It also sets out the roles and responsibilities of the key players charged with responsibility of managing health and safety in all forest operations.

The Programme for the Endorsement of Forest Certification (PEFC) standard specific to the Republic of Ireland was endorsed in December 2011. An FSC Irish standard was approved in 2012. A National Forest Standard based on the Ministerial Council on the Protection of Forests in Europe (MCPFE) Lisbon criteria and indicators (C+I) has been in place since 2000 but remains largely unused.

EU Timber Regulation (EU) No 995/2010 prohibits the placing on the EU market of illegally harvested timber and products derived from such timber. It requires EU traders who place timber products on the EU market to exercise 'due diligence'. To facilitate the traceability of timber products, economic operators in this part of the supply chain (referred to as traders in the regulation) will have an obligation to keep records of their suppliers and customers.

The Wood Fuel Quality Assurance (WFQA) launched in 2010 is a quality assurance scheme which certifies the quality of firewood logs, wood chip, wood pellets and briquettes formed from clean wood.

Standards for timber and timber products are set by the National Standards Authority of Ireland (NSAI) and CEN (Comité Européen de Normalisation). IS 444, the Irish standard for structural timber has been withdrawn and is due to be replaced by a National Workshop Agreement – Swift 6. The Irish standard for timber framed dwellings, IS 440, is being revised to comply with Eurocode 5 *Design of timber structures* (EC5).

A number of companies in the processing sector are approved under the ISO 9000 quality management assurance standard. To date none of the major companies has been approved under the ISO 1400 series relating to environmental management.

Policy Considerations

The processing sector will have to increasingly export product in line with the increase in forecast volumes. Compliance in meeting international standards, which govern trade in timber and timber related products, is essential for the development of the sector. Standards will need to be monitored on a continual basis and where necessary Irish standards amended to ensure that timber products are not excluded from potential export markets.

The public expectation is that forests are managed on a sustainable basis and that they provide in addition to timber, a range of environmental services and social benefits. Voluntary forest certification in the context of national measures provides an opportunity for the overall sector to show that it is behaving in a responsible manner in the management of the forest resource and by so doing increases public support for afforestation and other elements of forest policy.

The requirements of current health and safety legislation for the forest sector can be complex and requires expertise and competence to ensure implementation. Currently health and safety providers, often with no forestry background, offer services in this area but many lack the experience and professionalism required to ensure effective implementation and compliance across the sector. This gap needs to be addressed to ensure that sufficient expertise is available in the future.

Policy Statement

Forest products, forest services and the management of the forest resource will have a strong, market-led, quality focus.

Strategic Actions

8.1 DAFM to facilitate voluntary forest certification through the structure and content of environmental guidelines, an updated *Code of Best Forest Practice* and forest management planning systems, and through other measures, in order to facilitate access to market.

8.2 DAFM will engage in and support the development of forest product and other standards of relevance to the Irish forest sector.

9. Policy Implementation and Review

Current Features

The current forest policy and strategy as outlined in *Growing for the Future* and in particular the afforestation targets and funding has been the subject of a number of reviews.

1. Clinch (1999) undertook an assessment of the social costs and benefits of investments in afforestation with a particular focus on non-timber benefits. The Strategic Plan, *Growing for the Future*, was assessed using a cost benefit analysis which showed a rate of return of approximately 4%. It concluded that funding of the strategic plan could be justified subject to clarification of a number of issues.

2. The Timber Industry Development Group (TIDG) was given the remit to make recommendations on the optimum development of the industry sectors which process and market Irish wood and non-wood forest products. The group reported in 2001 and made a series of recommendations on (a) supply chain management, (b) research and development, (c) residues and pulpwood and (d) marketing. Key to the recommendations was the establishment of a Chief Executive's Strategic Forum. The report was not adopted by Government.

3. The review of Ireland's forest strategy (Bacon 2004) (a) reaffirmed the national afforestation target of 20,000 ha, (b) stressed the importance of non timber benefits and assigned values to these, (c) recommended a review of the premium payments and tightening of grant payments, (d) sought the establishment of a Forestry Development Forum and (e) the introduction of multi-annual budgeting. The report was not adopted by Government and was the subject of further internal evaluation and analysis by the then Department of Agriculture Food and Forestry (DAFF).

4. The Malone report in 2008 undertook a study of the factors affecting the rate of afforestation and to make recommendations as to how afforestation rates can be increased but without any further increase in forestry or other rural development aid rates (Malone 2008). The report made a series of 18 recommendations but failed however to identify an action plan to redress the fall in afforestation.

There is no official forum for the ongoing monitoring and review of forest policy and strategy. There is no annual reporting requirement on how policy is being implemented or any agreed indicators of achievement against which implementation progress can be judged.

There is no institutional mechanism(s) for overseeing policy implementation.

Policy Considerations

Since its foundation in 1990, twenty-one resolutions have been adopted at six Ministerial Conferences (Strasbourg 1990, Helsinki 1993, Lisbon 1998, Vienna 2003, Warsaw 2007 and Oslo 2011) and Ireland is a signatory to all of these. Through the FOREST EUROPE commitments, the concept of sustainable forest management (SFM) has been defined and continuously developed at the pan-European level. High-priority topics of FOREST EUROPE are to strengthen the role of forests in mitigating climate change, secure the supply of good-quality fresh water, enhance and preserve forest biodiversity and provide forest products. Other important tasks are to develop a framework for future forest collaboration and to explore the possibilities for a legally binding agreement on forests in Europe.

Forest policy and strategy is not a static process or document but rather one that changes and adapts in response to the needs of the State, the forest sector, the physical and biotic environment, the economic environment and overall Government policy. While changes may be expected to policy, if well developed and written then a full review should only be necessary once every decade or in the light of significant changes in the forest sector operating environment.

A number of European countries have made provision in their forest legislation for a national Forest Council / Forestry Forum which oversees policy implementation and acts as an overall co-ordination body for on-going policy development (Phillips, 2009). The forest liaison group, while providing an important forum for dialogue and communication within the sector, has no role in policy development or the monitoring of its implementation. To be effective, such a Forest Council would need to meet perhaps three times per year and have three subordinate committees: (i) COFORD to address the research and industry development agenda and chaired by an industry

person; (ii) a Schemes and Measures group to take the place of the forestry liaison group, and deal with stakeholder input on schemes and measures and be chaired by the Forest Service, and (iii) an environmental regulation group which would provide stakeholder input on environmental regulations and related matters and be chaired by the Forest Inspectorate and would have representation from NPWS and DoECLG. Specific actions in the policy could be allocated to each of the groups and their chairs or a specific person tasked with the job.

The Forest Policy Review Group was of the view that the case for a development agency, similar to those operating in the food and tourism sectors, should be considered. The agency would be responsible for the promotion of forestry, and for the international marketing of goods and services arising from the forest sector in Ireland. Examples of other agencies and international best practice would also be considered.

Policy implementation can only be judged against agreed indicators of achievement and in the context of the overall mix of policy actions. The current focus is on afforestation levels and supports for afforestation almost to the exclusion of the other important areas where policy has a role to play. This singular focus on one aspect of the growing sector needs to broaden to encourage a more holistic approach to policy development and supply chain management.

Implementation of policy will only happen if responsibility for the specified strategic action is clearly stated. Too often the sole responsibility has been left to the Forest Service or other State organisations. Private sector organisations and in particular representative bodies within the sector have an important role to play in facilitating the implementation of forest policy.

Policy Statement

Policy will be implemented through ongoing monitoring and reporting of progress in consultation with stakeholders, and the policy will be updated to meet changing needs and circumstances.

Strategic Actions

9.1 Establish a Forest Council, representative of the forest and related sectors, with a permanent secretariat and three subordinate committees (a) research and sectoral development, (b) schemes and measures and (c) environment, which would have the responsibility for ongoing monitoring and reporting of progress on policy implementation against agreed indicators of achievement and providing advice on the updating of policy and or strategic measures.

9.2 Establish a Task Force to consider the establishment of a stand-alone government body or agency which could have the responsibility of addressing development and promotion of the forest sector and forest products nationally and internationally. The Task Force would report to DAFM through the Forest Council.

9.3 The level of implementation of the recommendations from the BioForest report would be assessed by the environment group.

9.4 The Forest Service to publish five year and annual business plans which clearly set out the work programme for the coming period, indicators of achievement and the funding arrangements.

10. Cost Appraisal and Funding

Current Features

Since 2007, grant-aid funding for afforestation, roading and other schemes has been provided solely by Government. Prior to this, joint EU/State funding under the forestry related measures in the Rural Development Regulation was availed of.

The Government has allocated reduced funding for forestry up to 2016 in its review of capital expenditure (Department of Finance, 2010). Premium payments currently account for some 70% of the total forestry budget, while grants for afforestation (first and second instalment) account for more than 25% leaving a relatively small balance to fund other support measures.

Forestry is capital-intensive investment with costs front-loaded. Compared with other industrial sectors it has a relatively long period before returns are realised. The review of tax schemes (DoF 2006) recommended that the tax treatment of forestry should remain. The Commission on Taxation (2009) recommended that the taxation position related to forestry should be continued (8.75).

There is a growing interest worldwide in forestry as an investment due to a combination of (a) its low volatility, (b) relatively risk free status and (c) level of returns achievable. AIB Investment Managers and Irish Forestry Unit Trust (IForUT) have both purchased harvesting rights to forests in Ireland in 2009.

When there has been a reduction in funding for afforestation and related schemes, as for example in 2003, the sector has taken a number of years to recover even when funding was restored. This reflects the three year lead-in time for the provision of planting stock and the low margins in the contracting sector.

Policy Considerations

As an EU Member State, Ireland no longer operates an autonomous agricultural and rural development policy, but nationally implements measures under the Common Agricultural Policy. The CAP supports agricultural and rural development through measures grouped into two principal areas of intervention. Pillar 1 provides agricultural market and income support, with direct (area) payments representing the prevalent form of income support to the EU farmers. Pillar 2 addresses both the agricultural and forestry sector and the wider rural population through a comprehensive set of rural development programs. Support is provided through a menu of circa 40 measures, grouped under four intervention axes. From these, Member States can select the most suitable mix. Ireland chose to fund afforestation, forest roads and other forest schemes from its own budget from 2007 onwards.

The CAP Rural Development Programme (RDP) 2007-2013 recognises the importance of forests and their role in climate change, the provision of environmental services and their contribution to the rural economy. While forestry is not supported under this programme in Ireland, it receives exchequer funding under the National Development Plan.

Gearing up the forest sector to undertake increased planting levels or to change species requirement takes a number of years due to the lead-in time for nurseries to match future plant requirements. When funding was cut in 2003, nurseries and forest contractors took the brunt of the impact while the sector as a whole lost confidence. As a result, a return to previous higher levels of activity is difficult and takes a long period. A Government commitment to multi-annual funding would restore confidence to the sector and facilitate an increase in planting levels to those set out here as being necessary for the future development of the sector.

A heavy reliance on the State budget to fund all aspects of afforestation, forest roads and other silvicultural operations has left the sector overly exposed to changes in Ireland's economic situation. Some support schemes have been suspended e.g. NeighbourWood and pruning. Forests are a biological resource and have timing requirements for interventions and are different to many other classes of asset. A delay of one to two years in funding for roads can mean the difference between a crop being thinned with raw material being made available for wood energy and wood panels or remaining unthinned with a 20-year or longer wait for material to come to market. With the growing imbalance between supply and demand, it is vital that there is continuity in supports to leverage supplies. This could be more assured under EU co-funding arrangements than the current situation.

Currently the carbon benefits from Kyoto compliant forests accrue to the State and form part of the national emission reduction compliance regime. The CBA of future afforestation levels (Appendix 2) highlights the value of future sequestration. Coillte has undertaken research on the development of a carbon based afforestation scheme which in addition to acting as a catalyst for planting could reduce the Government's funding requirement for afforestation, particularly in relation to premium payments. The scheme is as yet not fully elaborated but may require a national scheme to enable trading in the carbon sequestered by forests. The scheme would be voluntary

as is the case with that recently introduced in New Zealand and could run alongside the existing afforestation scheme. Such carbon based afforestation schemes provide access to early revenue streams and in so doing provide the opportunity to open up afforestation to private sector investment, thereby reducing the burden on the State. Investigating these opportunities needs to take into account outcomes from the EC's review of the role of land use, land-use change and forestry (LULUCF) in relation to the Effort Sharing Decision, and the current negotiations on LULUCF rules underway in the UN Framework Convention on Climate Change.

The review of certain tax schemes (Department of Finance 2006) examined the tax reliefs around the operation of commercial woodlands and evaluated the impact of a range of possible interventions from the scrapping of tax reliefs to the maintenance of the status quo. The review concluded that *Any action which makes investment in forestry less attractive (such as the removal of the existing tax concessions) could make the attainment of this target even more difficult if not impossible and could undermine current Government forestry policy. For these reasons the study concludes the relief in its present form should be maintained.* However, this recommendation was not followed through in the in 2007 Finance Act which introduced exemption limits and the maximum amount of specified tax reliefs that were allowed was €250,000 or 50% of the total amounts of relief claimed, whichever was the higher. This was significantly reduced in 2010 to €80,000 or 20% of the total amounts of relief claimed, whichever is the higher. This level does not adequately take cognisance of the timing and scale of revenues from commercial woodlands wherein depending on site and management regimes from 60% to 100% of timber revenues can occur in the year of clearfell. Consideration should be given to the tax treatment of forestry investment to ensure that while the sector would make an appropriate contribution it does not act as a disincentive to investment. Specifically the timing, the threshold and the costs of reforestation should be examined.

A draft of the Funding Review report was made available in late March 2012 to this Review. The draft report, in identifying and examining a number of options regarding afforestation funding, and their strengths and weaknesses, did not make any recommendations. This Review did not have the time or resources to further assess or comment on the options outlined in the report.

Policy Statement

To support the development of the forest sector through a combination of funding and fiscal arrangements including joint EU funding, direct State funding and facilitating private investment.

Strategic Actions

10.1 The tax treatment of forestry should be examined taking into account the timing and scale of timber revenues and reforestation costs to ensure that tax treatment does not act as a disincentive for the achievement of national policy goals in particular forest cover, roundwood supply to industry and climate change mitigation.

10.2 The recommendations of the review of tax schemes (Department of Finance 2006) and the Commission on Taxation (2009) in relation to thresholds to be implemented.

10.3 DAFM to explore financial and funding mechanisms to encourage a greater level of institutional investment in afforestation and in mobilising wood supply from the existing private forest estate.

10.4 DAFM and the Forest Service to work with Coillte and other bodies to explore the viability and cost of a national carbon-based afforestation scheme.

10.5 Government to examine possibility of multi-annual funding for afforestation and forest road schemes.

10.6 DAFM to examine the feasibility of co-funding the afforestation programme and support measures under the Rural Development Regulation.

11. Legislation

Current Features

Forestry in Ireland operates within a legal and regulatory framework, and those involved in forest operations must be familiar with the various requirements entailed.

Much of the primary forest legislation owes its origin to the time when the State was responsible for afforestation and the private sector was relatively small and confined in the main to former estates.

A Consultative Group on the Review of Forestry Legislation was established by the Department of Agriculture and Food at the end of 2005 and concluded its work in October 2006. The previous Government approved the Heads of a new Forestry Bill in March 2009. In April 2013, the Forestry Bill 2013 was presented to the Houses of the Oireachtas. The purpose of the Bill is to reform and update the legislative framework relating to forestry in order to support the development of a modern forestry sector which reflects good forest practice and protection of the environment.

The Planning and Development (Amendment) Act 2010 amends the Planning Acts of 2000 – 2009 and envisages a closer alignment of the National Spatial Strategy with Regional Planning Guidelines, Development Plans and Local Area Plans, while also clarifying the key obligations required of Planning Authorities under the Birds and Habitats Directives. Section 4 amends the current exemption in relation to forestry works by maintaining the exemptions for thinning, felling and replanting, maintenance, etc. It also specifies that any development providing access to a public road, as for example a forest road, is not exempted development and must be subject to the planning process.

Regulation (EU) No 995/2010 also known as the (Illegal) Timber Regulation is aimed at countering the trade in illegally harvested timber and timber products and prohibits the placing on the EU market for the first time of illegally harvested timber and products derived from such timber and its application began from 3rd March 2013.

Primary Legislation

- Forestry Act 1946 and Forestry Act 1946 (Part IV) Regulations 1949
- Forestry Act 1956 (repealed by Wildlife (Amendment) Act 2000)
- Forestry Act 1988
- Local Government (Water Pollution) Acts 1977-1990
- Environmental Protection Agency Act 1992
- National Monuments Acts and Amendments 1930-2004
- Wildlife Acts 1976, 2000 and 2010
- Roads Act 1993
- Occupiers Liability Act 1995
- Waste Management Act 1996
- Litter Pollution Act 1997
- Planning and Development Act 2000
- The Safety, Health and Welfare at Work Act, 2005
- The Safety, Health and Welfare at Work (General Applications) Regulations 2007
- The Safety, Health and Welfare at Work(Construction) Regulations 2006 and amendments
- The Safety, Health and Welfare at Work (General Applications)Regulations 1993

Secondary Legislation

- The European Communities (Water policy) Regulations 2003 (SI 722 of 2003).
- The European Communities environmental objectives (surface water) Regulations 2009 (SI 272 of 2009)
- The European Communities environmental objectives (groundwater) Regulations 2010 (SI 9 of 2010
- European Communities (Environmental Impact Assessment) (Amendment) Regulations 2001 (S.I. No. 538 of 2001), as amended by the European Communities (Environmental Impact Assessment) (Forestry Consent System) (Amendment) Regulations 2006 (S.I. No. 168 of 2006)
- European Communities (Forest Consent and Assessment) Regulations 2010 (S.I. No. 558 of 2010)
- European Communities (Aerial Fertilisation) (Forestry) Regulations 2006 (S.I. No 592 of 2006), as amended by the European Communities (Aerial Fertilisation) (Forestry) (Amendment) Regulations 2007 (S.I. 790 of 2007)
- Safety, Health and Welfare at Work (Construction) Regulations 2006 (S.I. No. 504 of 2006)
- Safety, Health and Welfare at Work (General Application) Regulations 2007 (S.I. No. 299 of 2007)

- Freshwater Pearl Mussel Regulations. (S.I. No. 296 of 2009)
- Water Framework (S.I. No. 722 of 2003 and S.I. No. 413 of 2005)
- Planning and Development Regulations 2001 (S.I. No. 600 of 2001)
- Planning and Development Regulations 2008 (S.I. No. 235 of 2008)
- European Communities (Marketing of Forest Reproductive Material) Regulations 2002
- European Communities (Control of Organisms Harmful to Plants and Plant products) Regulations 2004
- European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011)
- European Communities (Environmental Liability) Regulations 2008,(SI 547 of 2008)
- Environment (Miscellaneous Provisions) Act, 2011

EU Legislation

- Council Directive 2000/29/EC on protective measures against the introduction into the Community of organisms harmful to plants or plant products and against their spread within the Community
- Council Directive 79/409/EEC on the conservation of wild birds
- Council Directive 85/337/EEC on the assessment of the effects of certain public and private projects on the environment
- Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora
- Council Directive 1999/105/EC on the marketing of forest reproductive material
- Directive 2000/60/EC establishing a framework for Community action in the field of water policy
- Directive 2001/42/EC on the assessment of the effects of certain plans and programmes on the environment
- Directive 2004/35/EC on Environment Liability with Regard to the Prevention and Remedying of Environmental Damage.
- Directive 2006/11/EC on pollution caused by certain dangerous substances discharged into the aquatic environment of the Community
- Directive 2009/28/EC on the promotion of the use of energy from renewable sources
- Directive 2009/128/EC establishing a framework for Community action to achieve the sustainable use of pesticides

International Agreements that Ireland is Party to

- Ministerial Council on the Protection of Forests in Europe (MCPFE)
- International Plant Protection Convention (IPPC), FAO
- IPPC, International Standards for Phytosanitary Measures (ISPM) No. 15, Regulation of Wood Packaging Material in International Trade
- The United Nations Framework Convention on Climate Change and the Kyoto Protocol
- The Convention on Biological Diversity
- Convention on access to information, public participation in decision-making and access to justice in environmental matters (Arhus Convention)

Policy Considerations

Forest legislation needs updating in light of the changing role of the State and the development of the private sector. Much of the legislation is based upon the State's ownership role in afforestation. There is now an opportunity to amend the legislation to underpin the principles and practice of sustainable forest management, recognise and facilitate the provision of environmental services and to relieve part of the regulatory burden on forest owners.

The felling licence procedure can lead to delays in bringing timber volumes to market. In its present form it does not protect against overexploitation of the resource. Its relevance has been eroded over time, especially in regard to thinnings and it has the potential to be streamlined. In countries with a strong tradition in forest management planning, the approved forest management plan acts as a permitting procedure for the specified harvesting interventions.

On 21st September 2011, the Minister for the Environment, Community and Local Government introduced Regulations bringing into effect from that date certain provisions of the Environment (Miscellaneous Provisions) Act, 2011. Section 17 of that Act, while it continues to exempt forest roads from the planning process, requires that the creation of an access from that road to a public road must be approved by the relevant Planning Authority.

Regulation (EU) No 995/2010 also known as the (Illegal) Timber Regulation requires EU traders who place timber products on the EU market for the first time to exercise 'due diligence; and to keep records of their suppliers

and customers (traceability). The draft rules are currently under public consultation. Member States are expected to draft implementing legislation, designate competent authorities (CA) and to lay down penalties (fines and or seizure of goods). The regulation has implications not only for timber growers but also manufacturers of wood and wood based products. It will be important to ensure that procedures for compliance and monitoring are appropriate and do not adversely impact on the wood paying capacity within the sector.

The obligation to replant following a clearfell or natural disaster essentially means that once land is afforested, it must remain under that land use in perpetuity. The legislation does allow for the removal of land from forestry, but the process is seen by many as too rigid and reflects the previous situation where the private sector had only a very minor role in afforestation. The consequence is that many landowners are now reluctant to afforest part of their holding as it locks the land into forestry and does not allow an "out" in the event of changing family or market circumstances. While it may not be in the interest of the State from a climate mitigation perspective to allow uncontrolled change of land use from forestry to agriculture or other uses, some more flexibility and clearer guidance could help to allay concerns about the maintenance of the land under forestry in perpetuity.

Policy Statement

To ensure that forest related legislation is relevant to the needs of the sector and underpins the principles of sustainable forest management while recognising the multifunctional nature of forestry.

Strategic Actions

11.1 DAFM to address implementation of Planning and Development Act in line with Strategic Action 2.7.

11.2 DAFM to ensure that the Forestry Bill includes provision for forest management plans and their use for simplified permitting procedures for the undertaking of forest operations including thinning, clearfelling and regenerative fellings.

11.3 DAFM to ensure that the Forestry Bill provides for a transparent and independent appeals procedure.

11.4 DAFM to include provisions in the Forestry Bill for a more flexible approach to the removal of areas from forestry to other land use types.

11.5 DAFM to ensure that the implementing legislation for the EU Timber Regulation takes full account of forest certification and chain of custody and does not adversely impact on the wood paying capacity within the sector.

12. Coillte

Current Features

Coillte, the State forest enterprise, was established by the Forestry Act, 1988 with an essentially commercial mandate to manage State forests in accordance with the principles of sustainable forest management and engage in related woodland industries. The company is divided into three businesses: Coillte Forest, Coillte Panel Products and Coillte Enterprise and employs approximately 1,100 people.

Coillte Forest manages all aspects of the Coillte forest estate including log sales, harvesting, reforestation and public good provision. The Coillte Forest estate extends to 442,000 ha of land of which 389,000 ha is afforested. Coillte no longer actively undertakes afforestation. Coillte is the dominant provider of roundwood logs supplying 85% of the wood fibre produced in the ROI. It is also the dominant user of contractors for harvesting and forest establishment.

In recent times, Coillte's turnover increased from €216m in 2005 to €318m in 2007 before falling back to €207m in 2009. Group turnover increased by €8.7m during 2011 to €259.1 m. According to the recent review of State assets (DoF 2011) in the eight-year period under review to end of 2009, Coillte reported aggregate pre-tax profits of €204 million, with profits on land sales accounting for 70% of this amount and profits on sales of immature forests a further 17%. Profits from forestry and its downstream operations (including log sales and CPP) – traditionally the core operations of the company - accounted for just 13% of profits over the period. Coillte Group's operating profit before exceptional items decreased from €46.1m in 2010 to €41.5m in 2011. Profit after tax fell from €32.1m in 2010 to €19.9m in 2011. The 2011 results include an exceptional charge of €9.1m compared with an equivalent charge of €1.4m in the previous year.

Coillte Panel Products (CPP) comprises Smart*Ply* Europe Limited which manufactures and sells oriented strand board (OSB) with a productive capacity of approximately 330,000 cubic metres per annum, and Medite Europe Limited (purchased in 2006), which manufactures and sells medium density fibreboard (MDF) with a productive capacity of circa 440,000 cubic metres per annum.

CPP is by far the largest user of small diameter roundwood in Ireland, consuming in excess of 1 million tonnes of pulpwood and sawmill residues each year.

Coillte Enterprise is the business development arm and consists of land sales and development, provision of sites for telecom masts, renewable energy, forest nurseries, provision of training and safety services and Irish Hardwoods (closed in June 2013). The remit of Coillte Enterprise is to drive value by leveraging the value of its land assets to avail of opportunities arising from developing our national infrastructure.

Coillte's development strategy focuses on maximising the value of the assets under its control particularly land to achieve national policy objectives in the areas of wind energy, broadband coverage and biomass.

Coillte Forests is in the process of transformational change including a review of how it places timber supply on the market. The outcome may see a significant increase in harvested sales. If this happens, then this could impact on the availability / development of harvesting capacity for the increasing private sector supply.

The COFORD Wood Demand Group report shows a significant shortfall by 2020 in projected timber supply over future wood fibre demand. As any increase in roundwood production over existing levels will come from privately owned forests, the development of harvesting capability and capacity for private growers is a major future strategic issue for the sector. It makes sense therefore that Coillte work with the private sector in developing harvesting capacity and infrastructure.

Strategic Actions

12.1 Coillte to work in co-operation with the industry and the private growing sector in developing a viable and competitive harvesting capability which will meet the needs of the overall sector. Any significant developments in harvesting systems should be implemented in a co-ordinated manner with all parties to ensure a strong and competitive national harvesting infrastructure.

12.2 Coillte to work in co-operation with other industry players to reduce supply chain costs. Coillte together with private owners, the forest industry and stakeholders should facilitate the development of a standard system for timber measurement and removals.

12.3 In conjunction with Strategic Action 4.4, Coillte, as an owner of public lands, to implement initiatives to progress co-operation with private growers in facilitating access to private forest areas for harvesting. Coillte and private growers to develop a framework to allow shared use of forest roads for forest operations

12.4 Any future strategy for Coillte should contribute to the sustainable development of the overall forest sector.

Strategic Observations

During the latter stages of the work of the forest policy review, the Government announced outline policies in relation to the structure of State companies and that it was considering the recommendations of the review of State assets, which includes a number of recommendations in relation to Coillte.

- Strong and open competition for wood fibre is necessary for the forest sector to become more competitive and to sell product at profit in home and export markets. Public and private forestry interests must operate on equal terms, with transparent pricing and cost structures.

- Public forests play a vital role in public recreation, in climate change mitigation and in biodiversity conservation and water quality. These roles need to be fully considered and taken into account in any change of management or operation of publically owned forest land.

Government decision on Coillte Harvesting Rights

The Minister for Agriculture, Food and the Marine has announced the Government decision in relation to the proposed sale of Coillte Harvesting Rights: “at its meeting today [19 June 2013], the Government decided that now is not the appropriate time to proceed with the sale of harvesting rights in Coillte and that the current focus must be on the restructuring of Coillte, overseen by NewERA and the relevant stakeholder Departments”. The announcement also states that a robust analysis [will] be carried out to evaluate how to give effect to a beneficial merger of Coillte with Bord na Mona to create a streamlined and refocused commercial state company operating in the bio-energy and forestry sectors, as committed to in the Programme for Government. The Minister also stated that “the Government decided that the annual delivery of a material financial dividend to the State be prioritised as part of the restructuring of Coillte” and that it had further decided that it will consider all the options to maximise value from Coillte when the restructuring is complete in 18 months time.

The Minister also referred to the process of the deciding on the harvesting rights issue: a number of detailed financial, technical and other specialist reports were prepared in relation to Coillte, by external specialist consultancy bodies, in full consultation with the Board of Coillte and its executive management. The announcement stated: “this analysis was quite extensive as it not only involved financial calculations associated with the sale process but also the possible impact on the timber industry, public access to recreational land, environmental and social impacts and consequential implications for the company. As I have said, on numerous occasions, the Government will continue to proceed carefully with the finalisation of any decision on this matter as we are determined to realise commercial potential but also to protect the public value that Coillte offers by maintaining public access to its forests and supporting the broader timber industry”.

13. Institutional Arrangements

Current Features

The Forest Service within the Department of Agriculture Food and the Marine (DAFM) is the national Forest Authority and is responsible for ensuring the development of forestry within Ireland in a manner and to a scale that maximises its contribution to national socio-economic well-being on a sustainable basis that is compatible with the protection of the environment.

Coillte is responsible for the management and stewardship of State forests.

The Forest Service is organised around a dual structure, which is not unique in the Civil Service, and is tasked to undertaking the administrative and technical functions of the Service. The professional/technical arm reports to a Senior Inspector and comprises a Forest Inspectorate with regionally-based officers and staff responsible for environmental compliance, forest inventory, forest protection, reproductive material and landscape design. The administrative arm has five main functional units dealing with (1) EU, legal and finance, (2) forestry support schemes, (3) fellings, inventory and information systems, (4) policy and (5) research, training, public relations (PR) and Coillte. Matters relating to forest products, renewable energy, climate change and forests, forest tree improvement and the COFORD council and publications are dealt with by the Forest Sector Development Division, forest product standard schemes are operated by the National Standards Authority of Ireland. The COFORD forest research programme comes under the Research Division of DAFM.

Forestry extension services to farmers and private owners are provided by the Forestry Development Department in Teagasc, which receives funding from the Forest Service to undertake this function. The Teagasc Unit provides advice, training and research on farm forestry and related matters.

Management of national parks (which include areas of native woodland) is the responsibility of the National Parks and Wildlife Service. The national arboretum at John F Kennedy Park in Co Wexford comes under the remit of the Office of Public Works.

Enterprise Ireland, the State agency responsible for supporting the development of manufacturing and internationally traded services companies, provides support for product and process development and the export of timber products.

Policy Considerations

There has been major reform over the past decade of the institutional arrangements for forests. The World Bank report on forest institutional reform (World Bank 2005) while not recommending any particular institutional model / arrangement clearly views forest institutions as providers of services as opposed to the more traditional view of a "permitting" or "timber providing" organisation. The focus on the efficient and quality delivery of services to customers (range of stakeholders within the sector and to the broader public) may require a reassessment of the capacities and resources available to the Forest Service.

The functions of the State in relation to forestry fall under four broad headings – (i) regulatory, (ii) supervisory, (iii) support and (iv) ownership. The Forest Service undertakes the regulatory role, which includes the formulation of forest policy and the drafting of legislation necessary for its implementation. The supervisory role which includes enforcing and controlling compliance with the law and the related statutory acts is more disjointed with a number of State agencies being involved. However, the Forest Service in addition to enforcement also has an overall co-ordinating role. The support function includes actions undertaken by the State and its institutions and, or by the financial support from the State to ensure maintenance of the forest's long-term functions and promote the development of the sector. The development of the sector cannot take place in the absence of reliable and up to date forest inventory and management planning information. This is normally undertaken by the State through the provision of a specialist unit and expertise which is responsible for national forest inventory and for the design and approval of forest management plans. The ownership role is vested in Coillte Teoranta which manages the State forest resource, apart from a small number of forest areas within national parks under the control of NPWS.

Policy Statement

To support the development of the Forest Service as an efficient delivery service organisation meeting the needs of Government, national forest policy and the forest sector.

Strategic Actions

13.1 DAFM should undertake a functional and efficiency assessment of the Forest Service which would examine the extent to which this structure is optimally efficient in the delivery of services across the sector and the extent to which skills capacities meet existing and future needs.

13.2 DAFM/Forest Service should establish permanent structures to support the development of the forest sector, in areas such as roundwood supply and demand, climate change mitigation, ecosystem services, wood energy, certification and product standards.

13.3 The Forest Service should re-instate a stand-alone Annual Report, providing a review of achievement versus specific goals in areas such as afforestation, timber production, environmental compliance and climate mitigation while also providing a statistical database for reporting and planning. The Annual Report should also feature on DAFM's website.

Appendices

1. Food Harvest 2020 – Forestry Recommendations

Restoring Competitiveness

DAFM and industry should further explore measures to bring about a significant increase in the annual afforestation level per annum to 2020. DAFM will continue to examine more efficient methods of increasing the planting level in view of its urgency. The Committee recommends the adoption of the target planting rates for afforestation to be agreed in the parallel Forestry Review due to report by the end of 2010.

1. Industry should promote producer groups in order to reduce management costs and increase the marketability of roundwood from private forests.

2. DAFM should continue to support the provision of the forest road network, while also evaluating new infrastructure systems.

3. Industry and representative organisations should support operator training and education.

4. Teagasc and the third-level institutions should ensure relevant and up-to-date training to meet new developments.

5. DAFM should continue to support the growing bioenergy sector through the Bioenergy Scheme, co-funded by the EU under the Rural Development Programme.

6. Supply chain mechanisms should be developed to ensure biomass crops are brought to market and full market returns realised.

7. The relevant State agencies, growers and the timber-processing sector should collaborate to improve and develop the timber industry supply chain to reduce costs and increase efficiencies.

8. DAFM should lead an intensive marketing campaign on the benefits of farm forestry, including the bioenergy market to attract new entrants.

Environmental Issues

1. DAFM and the relevant State agencies should continue to research the ability of forestry to sequester carbon and the extent to which it can help to reduce Ireland's greenhouse gas emissions from agriculture and the non-emissions trading sector in general.

2. DAFM and the relevant State agencies should consider the development of a national certification standard for sustainable forest management.

3. The industry should plant more broadleaf varieties to improve biodiversity and leisure benefits.

Research and Development

1. The timber processing industry should invest in R&D and innovation to assist product development and forestry management.

2. Teagasc should continue to research the potential of crops to provide energy and develop efficient production, harvesting and storage methods.

3. DAFM, via the COFORD research programme, should continue to support sustainable and competitive forestry practices and policies that contribute to building and maintaining a knowledge economy and scientific research in a vibrant forestry sector.

2. Forestry Cost Benefit Analysis

1.1 Introduction

"Cost benefit analysis (CBA) is an analytical tool used in the appraisal of major capital proposals. It provides decision makers with important information about proposed investments and assists in the decision making process through quantifying and monetising the costs and benefits associated with the main investment options"[21]. However, it is not all-embracing as not all costs or benefits can be quantified or monetised. It is used as one of a number of elements that decision makers will consider before deciding whether and at what level to invest in a capital project (such as an afforestation proposal).

Other factors which may not be able to be quantified or monetised need to be considered as part of the decision making process and these are in general outlined in a narrative. Factors may include competitiveness, distributional equity, sustainability of the project, impacts upstream or downstream to the wider economy, sustainability of roundwood supply, contribution to meeting other policy goals e.g. climate change and renewable energy. As Ní Dhubháin et al. (2006) has noted, CBA *does not allow the backward and forward linkages that connect the forestry sector to other sectors of the economy to be assessed.* The wider economic issues are outlined in the following four sections.

The key objective of the proposed afforestation programme is to *ensure a sustainable future supply of wood fibre of 8 million cubic metres per annum* to *support the growth and development of an internationally competitive and sustainable forest sector that provides a full range of economic, environmental and social benefits to society.*

A "do nothing" scenario is typically included in a CBA as a baseline against which to judge the impact of the proposed capital investment. This analysis does not undertake a CBA of current land-use i.e. agriculture, as the resources required are beyond those available to the Forest Policy Review Group (FPRG). However, Appendix 5, which analyses the impact of varying levels of afforestation on future roundwood supply, clearly shows the unsustainable nature of future roundwood supplies and the impact on growers and industry in the absence of an afforestation programme of the scale recommended in this report.

1.1.1 Background: Downstream Industry[22]

Wood processing industries dependant on the forest resource are primary processing (sawmilling), wood based panels (WBP), and wood energy. The furniture and joinery industry is more reliant on imported hardwoods but is also a user of Irish wood based panels.

In 2011, imports of forest products equalled €510 million, comprising mainly pulp and paper products (65.3%), with sawn timber and wood based panels making up the remainder. Exports of forest products totalled €308 million comprising WBP (€173 million) and sawnwood (€83 million). Irish sawmills had a 45% share of the domestic sawnwood market in 2012 (Knaggs and O Driscoll 2012a) and there are further opportunities for import substitution.

The primary products produced by Irish sawmills include construction / structural timber, pallet / packaging timber and fencing products. In the past, Irish produced structural timber was largely sold on the home market with pallet and fencing products making up the bulk of sawn timber exports. However, in recent years, Irish sawmillers have worked hard to develop new products and markets. Since 2007, the trend (in value terms) has been for Ireland to become a net exporter of sawn timber, largely due to the collapse of the domestic construction market and increased levels of exports to the UK. In 2011, sawmills processed 1.7 million cubic metres of roundwood, generating 0.76 million cubic metres of sawn timber. While the domestic sawn timber market declined by 53% over the period 2008-2011, sawn timber exports grew by 60% (Knaggs and O'Driscoll, 2012a).

In 2011 some 616,000 or 84% of WBP manufactured in Ireland were exported. Key markets were the UK and the Benelux countries. In 2009, Irish WBPs comprised the second largest source of supply of particleboard and OSB in the UK. Over the same period Ireland was the largest supplier of MDF in the UK marketplace.

Net trade in timber remains negative but, the deficit has more than halved since 2008 due to the fall in domestic house construction. The strengths of the downstream sector lie in its modern production facilities and its track-record in added value products. There are clear opportunities for development, but a key component of its long-term viability is a sustainable supply of easily procurable timber. The policy review report (Bacon 2004) highlighted this issue and recommended an afforestation level of 20,000 ha per annum, in order to smooth output projections and stimulate ongoing investment in processing capacity.

[21] Extract from the Report of the Interdepartmental Working Group: Reflecting the Cost of Carbon Emissions in Cost Benefit Analyses, October 2008 (Unpublished)

[22] Based on UNECE Timber Committee Market Report for Ireland 2010. Compiled on behalf of COFORD by Eoin O Driscoll, Drima Marketing.

1.1.2 Contribution to the National and Local Economy

The analysis of direct costs and benefits set out in the CBA is based on a "farm-gate" approach. In other words, the timber values used refer to the standing prices and do not take account of the wider impact for the local and national economy, or of the value added by processing.

The forest industry, comprising growing, harvesting and processing of forest products makes a significant and increasing contribution to the Irish economy. In 2010, direct output in the forestry (i.e. growing sector; excludes the processing sector) sector was €378 million and when the indirect and induced effects are taken into account this increases to €673.0 million. The total value to the economy of the overall processing sector was €2.20 billion (FORECON 2011).

Bacon (2004) estimated that the total workforce directly engaged in the growing and using of forest products or was engaged in related sectors as 16,175. In 2006, research which was undertaken by COFORD indicated that direct employment in the Irish forestry and forest products sector totalled 10,680[23,24].

In 2010, direct employment in forestry was 3,125. Accounting for the induced and indirect effects, the total employment supported by the forestry sector was estimated to be 5,531. Direct employment in the wood products sectors was 3,907. Accounting for the induced and indirect effects, the total employment supported by the wood products sector was estimated to be 6,408 (FORECON 2011).

Moreover, a recent study which was carried out by University College Dublin (UCD) has estimated that an annual afforestation programme of 15,000 ha would on average, create 490 direct jobs. Most of these would be based in rural communities in forest establishment, forest management, timber harvesting, road haulage and in timber processing.

The greater proportion of these jobs is rurally-based and they contribute to the stabilisation of local communities. This is especially so when the impact of forest premiums, mainly paid to farmers are added.

The ECONTRIB (Ní Dhubháin et al. 2006) report attempted to quantify the contribution of forestry to local and rural economies, examining the impacts (direct, indirect and induced) in three separate regions. In the West (Galway, Mayo and Roscommon), the contribution of forestry was valued at €75.5m, with over 1,000 people employed (FTEs). In the South-West (Cork and Kerry) the figures were €47.6m and 680 people employed, while in the Mid-East (Meath, Kildare and Wicklow), the annual contribution was valued at €69.3m with just under 1,000 in fulltime equivalent jobs. At a local level, therefore, forestry can be a significant employer with real economic impact.

1.1.3 Contributing to Renewable Energy Policy Goals

The key objectives of the Government's energy policy are (a) security of supply, (b) environmental sustainability and (c) economic competitiveness. From a forestry perspective, the sustainable energy sub-programme (COFORD 2010) outlines how the renewable energy sector is to be developed and key elements include (a) a target of 33% of electricity consumption from renewable sources by 2020, (b) to achieve 30% co-firing with biomass in the three peat fired power stations by 2015 (c) biomass power generation projects will be supported through the Renewable Energy Feed-in Tariff (REFIT) scheme (d) biomass in power generation will be supported by means of technology transfer, by investment in specific research and development programmes and by tackling supply issues and (e) the need to develop combined heat and power (CHP) and district heating schemes has been identified as an area where energy efficiency could be improved.

There are currently two commercial wood-fuelled biomass CHP plants in Ireland (Grainger Sawmills Ltd and Munster Joinery Ltd) and these rely heavily on processing residues as a fuel source. Edenderry Power, a peat-burning power station operated by Bord Na Móna, is currently working to increase the volume of wood biomass which is used as a feedstock for its electricity generating process. In 2009, the plant used 62,000 tonnes of woodchip and sawdust and a further 6,000 tonnes of wood pellets. The planned intake for the same mix of material in 2010 was 100,000 tonnes increasing to a requirement for 160,000 tonnes by 2016[25].

The use of wood biomass increased from 0.916 million cubic metres in 2010 to 0.963 million cubic metres in 2011 (Knaggs and O Driscoll 2012a). Demand in 2020 is predicted to increase to 1.7 million cubic metres.

Forestry is contributing to the achievement of renewable energy targets and will continue to do so. However, the long term sustainable level of its contribution is dependent on the scale and accessibility of the forest resource. A continuation of afforestation to maintain a sustainable level of supply of small roundwood would provide the confidence for the investment in CHP and other wood energy mechanisms (see Appendix 5).

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[23] http://www.COFORD.ie/iopen24/pub/ccn-se04.pdf

[24] COFORD Study; the Socio-Economic Contribution of Forestry in Ireland (ECONTRIB); http://www.COFORD.ie/iopen24/pub/econtrib20060808.pdf

[25] Reilly, John. (2010). *The Co-firing market for wood biomass*. Presentation National Forestry Conference, Generating revenue from your woodlands. 26th March, 2010.

1.1.4 Sustainable Supply

Due to the pattern of past planting, future timber yields will peak around 2035 (Appendix 5). In the absence of any future afforestation, there will be a dramatic fall off in future roundwood supplies from 2035 onwards which will act as a disincentive for industry to invest and result in an oversupply of roundwood in the decade pre-ceding this with reduced prices and returns to growers. A sustainable level of supply is key to underpin the development of the sector, and to contribute to the Government's targets for renewable energy, notwithstanding the contribution that future afforestation will make to overall wood supply and climate change mitigation.

2.1 Rationale for Forestry Cost Benefit Analysis

2.1.1 General

The economic analysis of forestry presents particular challenges. This is due to the very long term nature of the investment – at a minimum it can be 30-35 years before the full benefits accrue but this can extend to over 100 years for some broadleaved species. It is difficult to formulate assumptions underlying the analysis over such a prolonged period. The Department of Finance (1999) CBA code notes that *the appraisal timeframe should be over the estimated economically useful life of the project. Productive sector projects should generally be appraised over a 10 year period. Infrastructure projects should generally be appraised over a 20 year period. Residual values and/ or decommissioning costs at the end of the project's useful life should be included in the analysis*. The economically useful life of forestry is longer than conventional capital projects and especially so given Ireland's commitment to the principles of sustainable forest management which safeguards the future of forestry for future generations.

2.1.2 Non timber Benefits

A further difficulty with valuing afforestation is presented by the considerable range of non-timber benefits that can arise from forestry. Afforestation and forest management create a number of benefits which are either not priced by markets or are difficult to monetise. There are a range of non-market benefits or public goods, such as climate change mitigation, soil protection, landscape, flood mitigation, leisure and recreation opportunities and biodiversity. In addition, there are a number of benefits which are priced on the market. The public good nature of these positive externalities is often provided as an additional rationale for publicly funded Government support for forestry. Indeed results from previous studies suggest that the externalities are significant and can sometimes be greater than the associated timber benefits. This underscores the need to include externalities in any analysis, where possible and significant future State investment in forestry. The marketable outputs from forests include timber, hunting and other non-wood forest products such as foliage and fungi.

Cost-Benefit Analysis (CBA) helps factor in the value of some costs and benefits which do not currently have market prices or where the market price is imperfect. It estimates and totals the equivalent money value of the benefits and costs to society over the useful life of the project. This may help decision makers make a call on whether a proposal is worthwhile. Double-counting of costs or benefits should not occur.

2.1.3 Planting Assumptions

Presented here is a CBA of potential future afforestation programmes, all ending in 2039 at three different annual planting levels - 7,500, 10,000 and 15,000 ha - with an orderly scale down to no planting in 2044. The approach and methodology adopted is based on a previous CBA undertaken by Barwise (2009)[26].

Costs and benefits associated with planting levels are calculated and discounted to their Net Present Value (NPV). Only planting under the standard afforestation grant and premium scheme is considered[27]. The less capital intensive schemes such as the Native Woodland Scheme and the NeighbourWood Scheme are not considered in the analysis.

[26] This work expanded and updated previous work completed by DAFF in 2005. It was completed alongside a Committee comprising both internal DAFF personnel and academic expertise from the Institute of Public Administration.

[27] Forest Service (2003). Forestry Schemes Manual. Government Stationery Office, Dublin.

2.2 Cost Benefit Analysis Assumptions

Cost Benefit Analysis is by its nature greatly dependent on the assumptions used. The level and trend of activity levels used are indicative of both current levels and recent trends and are based on trend data supplied by the Forest Service. They are set out under the costs section below.

The following are the key general assumptions on which the analysis is based:

- The costs to the State are grants and premiums adjusted by a factor of 1.50 in line with guidance provided to the CBA by the Department of Agriculture, Food and the Marine and the Department of Finance.
- Premiums are treated as revenues.
- Average conifer timber prices for the past ten years, updated to 2010 values using the consumer price index (CPI).
- Estimated broadleaf prices based on a combination of limited Irish price data, UK price data and expert opinion (Phillips, H. (2008)).
- Estimates for the future market price are used per tonne of carbon dioxide sequestered using rates in the Department of Finance guidance note[28] which reflects the recommendations from an inter-departmental committee: *Reflecting the Cost of carbon emissions in Cost Benefit Analyses*. To estimate the impact of changes in carbon accounting rules, carbon stored in harvested wood products is included in the analysis as agreed in the LULUCF decision at Durban to allow Parties to estimate emissions from the harvested wood products pool based on delayed emissions
- Leisure and recreation benefits begin after 16 years and end at age of clearfell. A lower willingness to pay (WTP) is taken for conifers (€2.50 per visit) and a higher WTP is taken for broadleaves (€4.00 per visit) and 100 visits per ha was taken as the main parameter in the calculations (Barwise, 2009).
- Crops which are clearfelled are replanted (in line with current legislative requirements and Ireland's commitment to SFM) with the same species in the following year and continue to generate the range of benefits under consideration in this CBA. (This assumption would have to be revisited if large scale non-replanting after harvest was permitted.)

2.3 Cost Benefit Time-Period

This work considers annual afforestation for 30 years from 2010 to 2039, followed by a decline of 20 percent in planting each year, to allow for an 'orderly end' to afforestation, as opposed to having an abrupt halt. (There is no new planting after 2044.)

Typically CBA analyses the costs and benefits of a project over its economic life. This can be relatively straightforward when projects are relatively non-complex, as for example the construction of a new stretch of motorway or a water treatment works. The consideration of economic life in a forestry context is more complex. One view is that the economic life is equivalent to the economic rotation. However, once a crop is replanted, as is the legal requirement, it will continue to generate wood and other products and environmental benefits over the length of the second and indeed subsequent rotations, as long as the land use remains as forestry. The full extent of the carbon benefits will not be realised until such time as equilibrium is reached which is estimated as being of the order of at least two full rotations. In the context of slower growing broadleaf species such as oak, this would extend the period to consider benefits to 2245. Such long time periods, which assume certainty around timber yields and constancy of preferences across many generations, are difficult to rationalise.

In this analysis, a project time horizon of 80 years which is equivalent to just less than two rotations of the principal conifer and one rotation for hard broadleaf species is used. By year 80, only the first years planting of oak will approach maturity, while the last years planting of some soft broadleaves and diverse conifer species will also be approaching maturity. Sensitivity analysis is undertaken using a project time period of 60 years or slightly less than one and a half rotations of the main species used in the afforestation.

[28] Department of Finance guidance note of 5 June 2009: Revised arrangements regarding Department of Finance's Guidelines for the Appraisal and Management of Capital Expenditure Proposals in the Public Sector (2005) and Proposed Working Rules for Cost Benefit Analysis (1999)

2.4 Costs

2.4.1 General

The costs to the State calculated in NPV terms are those associated with the payment of afforestation grants and premiums and the forest roading grant. While the afforestation grant will on average cover all costs of establishment, the roading grant as outlined in Appendix 6 will only cover up 80% of costs, net of VAT, and subject to a current ceiling of €35 /metre, with the balance being contributed by the forest owner. The costs for the forest owners include maintenance, insurance, on-going management, a proportion of roading costs and reforestation following clearfell. As the timber prices used are stumpage prices and are net of costs of harvesting, no harvesting costs are included as this would constitute double counting. In line with the guidance note[29] on CBA and advice from DAFM[30], grants and premium values were increased by 50% to take account of the shadow price of public funds.

2.4.2 Deadweight

In the absence of grants and premium, there would still be a small area afforested annually. To estimate this, private planting from 1926 up to the introduction of the Western Package Scheme (WS) were analysed. The average annual rate of afforestation was 219 ha while the figure was 227 ha per annum in the ten years prior to the introduction of the WPS There were varying levels of State grants from circa 1931 onwards but none of which would cover anything approaching the costs of afforestation. A deadweight estimate of 200 ha per annum is used in the analysis.

2.4.3 Tax Treatment of Forestry

The review of certain tax schemes (Department of Finance, 2006) examined the tax reliefs around the operation of commercial woodlands and evaluated the impact of a range of possible interventions from the scrapping of tax reliefs to the maintenance of the status quo. The review concluded that *Any action which makes investment in forestry less attractive (such as the removal of the existing tax concessions) could make the attainment of this target even more difficult if not impossible and could undermine current Government forestry policy. For these reasons the study concludes the relief in its present form should be maintained.* However, this recommendation was not followed through in the in 2007 Finance Act which introduced exemption limits and the maximum amount of specified tax reliefs that were allowed was €250,000 or 50% of the total amounts of relief claimed, whichever was the higher. This was significantly reduced in 2010 to €80,000 or 20% of the total amounts of relief claimed, whichever is the higher. This level does not adequately take cognisance of the timing and scale of revenues from commercial woodlands wherein depending on site and management regimes from 60% to 100% of timber revenues can occur in the year of clearfell.

The estimation of the tax revenue forgone assuming the continuation of the current tax relief was not possible due to the limited resources available to the FPRG.

2.4.4 Agricultural Supports

Land which is afforested is typically marginal agricultural land although in recent years there has been an increase in the quality of land being planted. These lands are subject to a range of agricultural supports including Rural Environmental Protection Scheme (REPS) and disadvantaged area payments. The change of land use to forestry will result in a saving to the State in terms of agricultural payments while at the same time represent a cost in terms of premium payments. The difference between these two types of support will be the net cost to the State. Assuming a farmer with 40 ha who afforests an area of 10 ha and the land being included in REPS, then typically the net additional annual payment would be of the order of €212 per ha which is less than half of the current rate of premium.

The estimation of the future levels of support for agriculture and the net cost for change of land use to forestry is a complex area. Thus while the FPRG recognises the importance of including the benefit represented by the saving in agricultural support payments, it is not possible to provide a robust figure for this given the limited resources available to the FPRG.

[29] Proposed Working Rules for Cost-Benefit Analysis, CSF Evaluation Unit, June 1999.
[30] Gordon Conroy, Economics and Planning Division

2.4.5 Displacement

Displacement and substitution impacts are closely related. They measure the extent to which the benefits of a project are offset by reductions of output or employment elsewhere. In the context of this analysis it is recognised that the increase in forest recreation and leisure activities could impact on other recreation areas. However, the estimation of the level of displacement caused by forest recreation is extremely difficult to calculate in the absence of survey data[31]. Furthermore displacement values are context specific and as such cannot be taken from analyses outside of Ireland. The precise estimation of the displacement costs associated with increased forest recreation and leisure was not possible due to the limited resources available to the FPRG.

2.4.6 Operational Costs

Operational costs include (a) the cost of maintenance from year five until the year of clearfell differentiated by species with a higher value being used for broadleaved species, (b) the owners proportion of road construction costs, currently set at 20% with the unit cost for road construction based on the current average cost[32], (c) management cost where plantations are managed by either a consultant forester or forest management company on behalf of the owner, (d) reforestation costs which are assumed to occur in the year following clearfell with the costs being species specific and higher for broadleaved species and (e) road repair costs following harvesting (thinning and clearfell). As stumpage prices are used in the analysis, the costs of harvesting and transport are not included as to do so would be double counting.

2.4.7 Grants and Premiums

Two grant support schemes are included in the analysis - afforestation and roading. The afforestation scheme has two grants - establishment and maintenance, while the roading scheme has one grant, now payable in two instalments. An average conifer broadleaf ratio of 70:30 was used and within this, species were assigned to seven[33] of the eight standard Grant and Premium Categories (GPC). The discounted value of the grants represents circa 39.5% of the total cost. The premium payments are the largest contributor to costs and represent just over 60% of the total discounted value. Table 1 shows the discounted cost of State-led investment in afforestation varied from €1.307 billion for a 7,500 ha annual afforestation programme (over a period to 2043) to €2.614 billion for a 15,000 ha annual programme (over the same period).

Table 1: Discounted Value of Grants and Premiums at 4% Discount Rate (€ million)

	Afforestation Level (ha per annum)		
Period	**7,500**	**10,000**	**15,000**
Grants	515.8	687.7	1,031.6
Premiums	791.4	1,055.2	1,582.8
Total	**1,307.2**	**1,742.9**	**2,614.3**

2.5 Benefits

The categories of benefits considered are:

- Timber (including thinnings);
- Carbon sequestration;
- Biodiversity;
- Water quality;
- Leisure and recreation;
- Landscape; and
- Cultural Heritage.

There will also be benefits associated with additional employment (given that we are now not in a full employment situation). Based on findings from the ECONOTRIB project (Ni Dhubháin et al. 2006) each 15,000ha

[31] Bryden, D.M., Westbrook, S.R., Burns, B., Taylor, W.A., and Anderson, S. 2010. Assessing the economic impacts of nature based tourism in Scotland. Scottish Natural Heritage Commissioned Report No. 398

[32] Forest Service Monthly Report October 2011.

[33] The same species mix was used to estimate the carbon sequestered and as Beech was not used as a typical species for carbon calculations, GPC 7 was excluded.

afforestation will result in the creation of an estimated further 490 jobs in planting, managing, harvesting and processing. By the end of the afforestation programme outlined here, the level of rural employment provided by forestry will have increased significantly. Due to the limited resources available to the FPRG, it was not possible to quantify the employment benefits associated with the proposed afforestation programme.

Residual benefits refer to those benefits which will accrue beyond the project timeframe. Forests are a renewable resource, so in theory, all of the plantations established under the proposed afforestation will continue to deliver benefits not just for future generations but future centuries. In practice some benefits will plateau after a number of rotations as for example carbon sequestration when an overall equilibrium value is reached. Other benefits, as for example recreation, will fluctuate depending on the stage of development of the forest. In an attempt to capture the residual benefits, the approach taken was to grow the forest plantations until the discounted benefit approached a relatively low value that would not impact on the analysis.

2.5.1 Timber

A yield model based on (a) Forestry Commission yield tables, (b) a ratio of thin to no-thin regimes for conifer[34] species similar to the private sector forecast (Phillips et al. 2009), (c) the same species ratio as used in the calculation of the costs (d) yield classes 20, 16, 10, 8 and 6 for Sitka spruce, Norway spruce, Japanese larch[35], ash and other soft broadleaves and oak respectively and (e) a rotation similar to that adopted to estimate carbon sequestration was developed. Volumes were adjusted to allow for open space and unproductive areas. Unlike the previous CBA (Barwise, 2009), volumes were also adjusted to take account of losses during harvesting in keeping with the approach used in the private sector (Phillips et al. 2009) and all-Ireland roundwood production forecasts (COFORD 2011).

2.5.2 Carbon Sequestration

The carbon sequestration models for the same species, yield classes and management regimes used to estimate the roundwood volumes were provided by Dr Kevin Black (leader of the COFORD-funded CARBWARE project). These detailed the net rate of carbon sequestered for each year of the rotation over two rotations apart from oak. Unlike the previous CBA (Barwise, 2009), the carbon sequestration models also provided prudent estimates of the carbon stored in harvested wood products (HWP), as these are to be included in carbon accounting from 2012 onwards.

The Department of Finance-led inter-departmental working group, *Reflecting the Cost of Carbon Emissions in Cost Benefit Analyses* recommended that the market price be used for monetising emissions. In order to ensure consistent use of the market price across projects in different sectors, the Department of Finance has calculated and set prices. For the period from 2008 up to and including 2014, it recommended that an average of the futures price, on the European Climate Exchange (ECX), for the preceding three months should be used. (For the period beyond 2015 €39 per tonne CO_2 is the recommended price[36].)

2.5.3 Biodiversity

Bacon (2004) estimated that the current forest estate yields an annual biodiversity benefit of €5.6 million. Clinch (1999) considers that afforestation *has the potential to destroy valuable habitats if planting takes place in 'sensitive' areas. However if planting is kept out of NHAs and sensitive areas to be designated by Local Authorities, the threat to biodiversity is low such that one rather limited diversity will be replaced by another limited diversity*. The implementation of environmental guidelines for biodiversity, water quality, archaeology, harvesting, aerial fertilisation and the procedures for environmental screening of all afforestation applications should limit potential negative impacts and could potentially enhance biodiversity on a range of sites.

A report on the economic and social aspects of biodiversity (DoEHLG, 2008) estimated the value of ecosystem services from forestry (excluding carbon sequestration) as being €55 million with some €50 million being attributed to soil biota (nutrient recycling) on the premise that forestry provides a similar contribution as agriculture but generates a gross revenue of €16,000 per hectare.

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[34] Yield models for no thin regime of broadleaf species were unavailable to calculate carbon sequestered and in consequence all broadleaves were assumed to be thinned.

[35] Japanese larch, due to concerns regarding *Phytophthora ramorum*, was removed from the list of acceptable tree species for grant aid by the Forest Service in October 2010. It is used here as a surrogate for a suitable replacement species.

[36] This recommendation was based on an EU Commission estimate around the time of writing the report of the Interdepartmental working group, that the likely market price for carbon in the period 2013 to 2020 would be €39/t.

2.5.4 Water Quality

The costs and benefits of forestry on water supply, water quality and river/stream flow have not been measured in Ireland, although Clinch (1999) suggested that the costs of the effects on water from afforestation under the current *Forestry Strategy* would amount to circa IR£10 million. This figure assumes an acidification cost of zero. However, this was based on the early years of the *Forest Strategy* and implementation has changed in the meantime with the introduction of environmental guidelines for water quality, harvesting and aerial fertilisation. Bacon (2004) indicates that there is some minor negative impact on water quality but these will be offset in the future as regulations are adhered to. The introduction of the Water Framework Directive (WFD) has significant implications for forestry in Ireland and its drive towards 'good' ecological status for all surface and ground waters means that any adverse impacts on water by forestry will be punishable by law.

This analysis, while recognising that afforestation if undertaken in an inappropriate manner will have a negative impact on water quality, assumes a nil value in relation to water quality on the basis that future afforestation complies with environmental guidelines and forestry measures under the WFD.

2.5.5 Leisure and Recreation

The fact that the leisure and recreation benefits of forestry can be substantial is shown by the EU estimate that the annual return from forest recreation is in the region of €2.6 billion (Cregan and Murphy 2006). There have been a number of Irish studies that have considered the key factors in terms of valuing the leisure and recreation benefits of afforestation. Factors considered include:

- Willingness to pay (WTP) by visitors;
- Number of visitors;
- Area afforested; and
- The type of forestry.

For the purposes of this CBA and to try and achieve an appropriate valuation in the absence of primary research, leisure and recreation benefits were taken to start only after 16 years and end at clearfell and to restart once again when the reforested crop reached 16 years of age and end again when the second crop was clear felled. A lower WTP is taken for conifers (€2.50 per visit) and a higher WTP is taken for broadleaves (€4 per visit).

Not all of the planned private sector afforestation is likely to be available or used for recreation due to a combination of (a) access, (b) small size and (c) owner's concerns and (d) lack of facilities. Based on an accessibility analysis of the private sector grant-aided estate undertaken for the COFORD funded FORECAST project and on an analysis of the size distribution of private planting, some 30% of future afforestation is considered to have the potential to provide recreational benefits.

2.5.6 Landscape

The previous review of Forest Policy (Bacon 2004) reported that valuations investigating public preferences and willingness to pay for forested landscapes, seen either from home or during regular journeys to and from home have been undertaken in the UK[37]. Of the preferences investigated, the strongest were for plantings that mixed trees and open space and where spacing of trees was random rather than regular. If these preferences were translated to forest structures, it might be expected that respondents would prefer the forest to look more natural and that there would be a preference for small scale rather than large plantations and a high species variety. If preferences for these attributes are separable and additive, then those configurations that offer all of the favoured factors should attract the highest values.

2.5.7 Cultural Heritage

The upgrading and maintenance of a wide network of trails and recreation sites by Coillte, coupled with the incorporation of many of the archaeological sites, monuments, structures, and cultural heritage features into sign-posted walking routes by both Coillte and other local tourism groups, has greatly enhanced the awareness and accessibility of the sites as well as the economic value of the recreational/tourism product available in a number of locations. Similar opportunities, subject to careful planning and management, may be available to some owners within the private forest estate.

[37] Willis et al. (2003). *The Social and Environmental Benefits of Forests in Great Britain*. Report to the Forestry Commission.

Whilst the protection of and access to archaeological sites and monuments, protected structures, and other cultural heritage features are not strictly public goods arising directly from forestry, the provision of these services through the public ownership and open forest policy on the Coillte forest estate and in the future through private sector initiatives could be considered as indirectly provided public goods.

This analysis, while recognising that afforestation if undertaken in an inappropriate manner will have a negative impact on water quality, assumes a nil value in relation to cultural heritage on the basis that future afforestation complies with environmental and archaeological guidelines and codes of best forest practice.

2.6 Overall Results

The overall results are shown in Table 2. Carbon is the greatest contributor to overall benefits representing 39% and is more than the combined value of timber, leisure and residual value.

Timber accounts for 16% of discounted benefits. The inclusion of harvest losses incurred during thinning and clearfell operations reduces overall volumes and revenues by approximately 10% while the use of oak as one of the two broadleaf species further reduces the discounted value due to its long rotation length the impact of which is to value each €1,000 of clearfell revenue at only €43 in today's values.

Table 2: Discounted Value (€ million) of Costs and Benefits at 4% at Different levels of State-led Investment in Afforestation

	Costs		Benefits					
Afforestation (ha per annum)	Grants + Premium	Operational	Premium	Timber	Carbon	Leisure + Recreation	Residual	BC Ratio
7,500	1,960.75	205.27	791.4	401.2	993.2	136.5	232.3	1.18
10,000	2,614.33	273.70	1,055.2	538.6	1,333.3	185.9	313.7	1.19
15,000	3,921.49	410.55	1,582.8	813.5	2,013.5	284.8	476.5	1.19

Leisure and recreation contribute a modest 6% to overall discounted benefits. The relatively low value for leisure in comparison with the previous CBA (Barwise 2009) reflects a more realistic assumption that only a proportion of future private afforestation will be available for this purpose.

The overall benefit-cost ratio is 1.19 showing that the afforestation program generates more benefits than the associated cost for its implementation[38].

The benefit-cost ratios are the similar for each of the three afforestation scenarios as there is a linear relationship between costs, roundwood volumes, leisure benefits and carbon sequestered and the area afforested. However the deadweight has a greater impact on the 7,500 ha programme and hence the slightly lower benefit cost ratio.

2.7 Sensitivity Analysis

The function of sensitivity analysis is essentially to see how the project or programme would change with elements of uncertainty and risk. As stated by the Department of Finance[39] - *Sensitivity analysis should always form a part of the appraisal of major projects. This involves evaluating proposals over a range of assumptions about key factors (e.g. prices, costs, interest rates on any borrowed funds, growth rates, and demographic changes).*

This analysis does not present the detailed results of all the sensitivity tests undertaken rather it presents the results of those with major impact.

2.7.1 Discount Rate

The Department of Finance test discount rate, currently 4%, is used in the analysis as it is that recommended by the Department of Finance for cost benefit and cost effectiveness analysis of public capital investment projects.

The discount rate in the economic analysis of investment projects should reflect the social view on how future benefits and costs are to be valued against present ones. The main theoretical approaches are:

[38] The benefit-cost ratio, when combined with the discount rate of 4%, equates to an internal rate of return of 5.52%.

[39] Department of Finance, (1994) **Guidelines for the Appraisal and Management of Capital Expenditure Proposals in the Public Sector,** Department of Finance.

- That marginal public investment should have the same return as the private one, as public projects can displace private projects;
- To derive the social discount rate from the predicted long-term growth in the economy; and
- A third, more recent approach, and one that is especially relevant in the appraisal of very long-term projects like forestry, is based on the application of variable rates over time. This approach involves decreasing marginal discount rates over time and is designed to give more weight to project impacts on future generations. These decreasing rates help mitigate the so-called 'exponential effect' from the structure of discount factors, which almost cancels more distant economic flows when discounted in a standard way (European Commission, 2008).

The UK Treasury Green Book states that *where the appraisal of a proposal depends materially upon the discounting of effects in the very long term, the received view is that a lower discount rate for the longer term (beyond 30 years) should be used*. The main rationale for declining long-term discount rates results from uncertainty about the future. This uncertainty can be shown to cause declining discount rates over time (Weitzman, 2001, Gollier, 2002). It recommends that for costs and benefits accruing between 31-75 years into the future, the discount rate should be reduced by 0.5% and for costs and benefits in years 76-125 years a further 0.5% reduction should apply.

Opinion however is divided on this approach and the Evaluation Unit of Directorate General (DG) Regional Policy in its CBA guide takes an alternative view. While recognising that Member States sometimes use multiple discount rates for different sectors and assign a lower discount rate to forestry or other long term projects it regards this practice as a shortcut and not easy to justify. It recommends the best practice is to try to identify all the benefits of the project and include them in cost-benefit analysis, without allowing them the implicit premium implied by a lower discount rate.

The discount rate used has a significant impact on the overall results. Reducing the rate improves the benefit-cost ratio as costs in afforestation programmes are mostly front-loaded while the benefits take time to accrue in line with the biological growth pattern of forest crops. At a 3% discount rate, the benefit-cost ratio increases to 1.38. In contrast when the discount rate is increased to 5%, benefits still outweigh with the ratio decreasing to 1.06 (Table 3).

Table 3: Discounted Value (€ million) of Costs and Benefits of State-led Investment in Afforestation at Varying Discount Rates

Discount Rate (%)	Costs	Premiums	Residual	Timber + Non Timber Benefits	BC Ratio
3.0	5,375.18	1,958.2	937.9	4,498.8	**1.38**
3.5	4,813.08	1,757.7	660.2	3,730.7	**1.28**
4.0	4,332.04	1,582.8	476.5	3,111.8	**1.19**
4.5	3,917.80	1,429.6	353.0	2,610.2	**1.12**
5.0	3,559.01	1,295.2	268.5	2,201.3	**1.06**

2.7.2 Percentage Non-Farmer Planting

Forest premium rates are significantly greater for farmers than non farmers both in annual rates and in the duration of payments. The uptake of afforestation by non-farmers has been relatively low and a rate of 10% in future planting has been assumed. However, this could be an underestimate in view of the uncertainty of agricultural payments to farmers post 2013 (see Strategic Action 1.10).

Increasing the percentage of non-farmer in future afforestation reduces the cost to the State while benefits remain apart from the value of premiums which decreases. The net impact is to improve the benefit-cost ratio (Table 4). At a non-farmer level of 30% of planting, the benefit-cost ratio at 1.23 which is less than for a 0.5% reduction in the discount rate.

Table 4: Discounted Value (€ million) of Costs and Benefits at Increasing levels of Non-Farmer Involvement in Grant-Aided Afforestation

% Non Farmer	Costs	Premiums	Residual	Timber + Non Timber Benefits	BC Ratio
10	4,332.04	1,582.8	476.5	3,111.8	**1.19**
15	4,258.35	1,533.6	476.5	3,111.8	**1.20**
20	4,184.66	1,484.5	476.5	3,111.8	**1.21**
25	4,110.97	1,435.4	476.5	3,111.8	**1.22**
30	4,037.27	1,386.3	476.5	3,111.8	**1.23**

2.7.3 Price of Carbon

The Department of Finance guidance note cites a forecast price[40] for sequestered carbon post 2015 of €39 per tonne of CO_2. It is envisaged that the Department of Public Expenditure and Reform will revisit the issue of pricing carbon in 2012. There are widespread opinions as to what is the most appropriate monetary value or methodology to place on carbon sequestered in the future. A recent review of mid to long term carbon price forecasts (EcoSecurities 2009) showed a wide range of prices depending on the underlying assumptions, models used and their parameterisation. Prices post 2020 ranged from $257 to less than $0.41 per tonne of CO_2.

Table 5:
Discounted Value (€ million) of Costs and Benefits of State-led Investments in Afforestation at Varying Prices for Carbon Dioxide

Carbon Price (€/tCO2)	Costs	Premiums	Residual	Timber + Non Timber Benefits	BC Ratio
30	4,332.04	1,582.8	424.1	2,650.0	**1.07**
35	4,332.04	1,582.8	453.2	2,906.6	**1.14**
39	4,332.04	1,582.8	476.5	3,111.8	**1.19**
45	4,332.04	1,582.8	511.5	3,419.7	**1.27**
49	4,332.04	1,582.8	534.8	3,625.0	**1.33**

Decreasing the long term price of carbon to €30 per tonne CO_2 has a significant impact on the level of benefits which reduce by €0.51 billion resulting in a reduced ratio of 1.07 (Table 5). Increasing the carbon price by €10 per tonne has the opposite effect increasing the level of benefits by €0.51 billion resulting in a ratio of 1.33.

2.7.4 Proportion of Afforestation Providing Recreation Benefits

At 30% of afforestation, the area of future planting that will provide leisure and recreation benefits is significantly lower than for previous CBAs (Bacon 2004 and Barwise 2009). The lower figure is considered more realistic in the light of the scale and location of future planting together with forest owners' willingness to adopt an open forest policy similar to that for State forests.

Over time, however depending on the experience of forest owners, the area available for leisure and recreation may either increase or decrease. The impact of up to +/- 20% on the basic assumption of 30% is indicated in Table 6. Due to the relatively conservative WTP values used for recreation, a 10% increase in the area available for recreation only increases the overall benefits by €0.11 billion with a resulting increase of the benefit-cost ratio to 1.22 (Table 6). A reduction in the area available has a broadly similar negative impact on benefits and the benefit-cost ratio. Overall, the ratio is moderately sensitive to changes in the area available for recreation within the range of percentages considered.

Table 6:
Discounted Value (€ million) of Costs and Benefits at Varying Recreation Use Levels in Grant-aided Afforestation

% Afforested Area	Costs	Premiums	Residual	Timber + Non Timber Benefits	BC Ratio
10	4,332.04	1,582.8	448.4	2,921.9	**1.14**
20	4,332.04	1,582.8	462.5	3,016.9	**1.17**
30	4,332.04	1,582.8	476.5	3,111.8	**1.19**
40	4,332.04	1,582.8	490.6	3,206.8	**1.22**
50	4,332.04	1,582.8	504.6	3,301.7	**1.24**

[40] Which was the best estimate of the EU Commission (around the time of writing the Report of the Interdepartmental Working Group: Reflecting the cost of carbon in Cost Benefit Analysis) of the future price for carbon in the period 2013 to 2020

2.7.5 Project Time Horizon

As mentioned previously, forestry with the relatively long period between planting and receipt of the main revenues (at regeneration felling), does not readily suit the typically much shorter and more discrete timescale for the economic life of other capital investments. A time horizon of 60 years was used to test the sensitivity of the costs and benefits. A longer time period was not considered for the reasons outlined earlier.

Table 7:
A Comparison of the Discounted Value (€ million) of Costs and Benefits for Two Investment Time Horizons

Project Horizon	Costs	Premiums	Residual	Timber + Non Timber Benefits	BC Ratio
80 Years	4,332.04	1,582.8	-	3,111.8	**1.08**
60 Years	4,332.04	1,582.8	-	2,365.2	**0.91**

All of the costs accrue prior to the end of the 60 year time horizon. The shorter project period is however sufficiently long to capture the greater part of the benefits arising from carbon, timber and recreation. Thus the impact, ignoring residual values, on the overall benefit-cost ratio is to reduce it to 0.91 with costs outweighing benefits.

3. Policy Formulation Process

Background

In October 2009, the Government of the time published its Renewed Programme for Government, which contained many positive aspects in relation to forestry including a commitment to increase annual planting to 10,000 ha. It also committed to *review State forestry policy to take account of its critical role in relation to climate change and its importance to construction, bio-energy, bio-diversity and its potential to deliver long-term employment in other downstream industries e.g. eco-tourism, furniture, crafts etc. The review will include the role of Coillte and its functions and operations. It will also assess the effectiveness of current forestry grant schemes and make recommendations on how best to deliver supports in the future*.

To facilitate this review, three groups were established:-

1. An overarching group with wide stakeholder and institutional representation dealing with national forest policy;
2. An interdepartmental group dealing with the funding of forestry schemes; and
3. An interdepartmental group with Coillte representation dealing exclusively with the role, functions and operations of Coillte.

Forest Policy Review Group

In April the DAFF, now DAFM, established a broad-based Forest Policy Review Group:

Mr Joe Barry	Committee member, Crann
Mr Pearse Buckley	Programme Manager, Bioenergy and CHP, Sustainable Energy Authority of Ireland
Ms Marian Byron	Director, Irish Forestry and Forest Products Association
Mr Gordon Conroy	Principal Officer, Department of Agriculture, Food and the Marine
Dr John Cross[41]	National Parks and Wildlife Service
Mr Noel Foley	Forestry Inspector, Department of Agriculture Food and the Marine
Dr Eugene Hendrick	Senior Inspector, Department of Agriculture Food and the Marine (Chairman)
Ms GeorginaHughes-Elders	Assistant Principal, Department of Public Expenditure and Reform
Mr Sean Lenihan	Chairman, Association of Irish Forestry Consultants
Mr Michael Lynn	Finance Director, Woodfab Timber Ltd and Chairman of COFORD
Mr Gerard Murphy	Director of Forestry, Coillte
Ms Anja Murray	Environmental Pillar
Dr Nuala Ni Fhlatharta [42]	Head, Forestry Development Unit, Teagasc
Mr Stiofán Nutty[43]	Ministerial Adviser
Ms Geraldine O'Sullivan	Farm Forestry Development Officer, IFA
Mr John Phelan	Director, Woodland Managers Ltd
Mr Donal Whelan	Technical Director, the Irish Timber Growers Association
Mr Michael Young	Senior Adviser, Department of Environment, Community and Local Government
Ms Orla Cashen	Review secretary, Executive Officer, Department of Agriculture, Food and the Marine
Mr Henry Phillips	Forestry consultant to the review

The terms of reference of the FPRG were;
Review and update national forest policy goals with reference to:

1. The level of afforestation, taking into account its contribution to rural development and employment generation, the funding of the afforestation programme, and the provision of public goods and services, including climate change mitigation;

[41] Co-opted after appointment of the Group
[42] Replaced during leave by Ms Mary Ryan, Teagasc
[43] Ceased membership on formation of the 31st Dáil

2. Species composition and structure of the forest estate, taking into account sustainability and competitiveness in wood supply, and the conservation of indigenous biodiversity and tree species;

3. Future roundwood supply and demand and
   (a) Its ability to meet national bio-energy targets;
   (b) Its ability to meet raw material demand for wood product manufacture (including locally based enterprises); and
   (c) Investment in forest roads and other infrastructure to mobilise the supply.

4. Research and development, and innovation in the forestry sector; and

5. Standards, guidelines and monitoring.

Policy Formulation Process

The policy formulation process consisted of four main elements;

1. An open call for submissions to the policy review (Appendix 7),

2. Reports from the two interdepartmental groups looking at Coillte and the funding for afforestation[44].

3. Workshops where the revised policy and supporting actions were formulated; and

4. Meetings where the main topics being addressed by policy were discusses and where the final policy document was developed and agreed

The FPRG met on 15 occasions and was supported by a series presentations and working documents prepared by Dr Āine Nī Dhubhain (UCD), John Cross and Liz Sides (NPWS), Gordon Conroy (DAFF), Dr Eugene Hendrick (Forest Sector Development, DAFM), Ciaran Black (Coillte) and Henry Phillips (Consultant to the Forest Policy Review Group).

No.	Date	Topic
1	21-05-2010	ToR, Timeframe, Working Arrangements, Forest Sector Note
2	18-06-2010	Long term wood supply, Wood processing
3	8-07-2010	CBA afforestation, Approaches to afforestation, Species
4	29-07-2010	Valuing public goods (UCD), Environment (DEHLG)
5	15-09-2010	Research, Certification, Training
6	28-09-2010	Workshop – Afforestation, Environment + Public Goods; Management of the Resource
7	19-10-2010	Workshop – Innovation, Research & Training + Forest Protection and Health. Review of first draft of policy
8	02-11-2010	Wood Processing
9	29-06-2011	Review third draft circulated November 2010
10	21-07 & 22-07-2011	Detailed review of part of Forest Policy draft, version 1.4
11	16-09-2011	Completion of detailed review (Version 1.6) and comments
12	20-10-2011	Review of comments received on draft (Version 1.7)
13	17-11-2011	Review and comments received on draft (Version 1.8)
14	20-12-2011	Review and comments received on draft (Version 1.9)
15	26-01-2012	Review and comments received on draft (Version 1.10)

[44] The report of the interdepartmental group reviewing Coillte was not made available to the FPRG. The report on funding for afforestation was made available to the FPRG on 27th March 2012 which was subsequent to the group's final draft of the policy review.

4. International Markets and Trends

Markets (Based on Timber Committee Statement on Forest Product Markets in 2012 and 2013)

Following the 2010 and early 2011 improving trends, the recovery in the UNECE region[45] within forest products markets stalled. The exception was the CIS region, where many markets have improved to pre-crisis (2007) levels. Consumption of forest products in 2011 remained flat in most of the UNECE region, 10% lower than before the global financial crisis. But in the Russian Federation, consumption grew by 9%. In spite of the continuing uncertainty and the difficult economic conditions, the consumption of some forest products showed slight growth in 2011. Forecasts of consumption are for further weakness in 2012 (-0.9%) with a slight increase in 2013 (0.5%), led by North America. China continues to be an important forest products market for the UNECE region. Rising Chinese domestic demand is partly responsible, as is further manufacture and export back to the UNECE region. A shortage of raw materials amid rising domestic consumption (increasing faster than GDP) will continue the trend of increased imports. North Africa and the Middle East continue to be an important importer of European wood products, despite the effects of the "Arab Spring". North America has become an increasingly important supplier of wood pellets for Europe. In addition, South America is producing many products that directly or indirectly compete with products from the UNECE region.

Historically, the construction sector has been the primary catalyst for the demand for forest products. Overall, in Europe and North America, the housing market has not yet shown any strong recovery from the recession. New housing starts and sales in the US are at their lowest levels since modern records began to be kept in 1963 but are showing signs of recovery. The market in Canada has seen a much smaller decline and has improved in 2012 but a slowdown is anticipated in 2013 as tighter mortgage qualification standards are introduced.

Consumption of industrial roundwood in the UNECE region was up for the second year in a row in 2011, but was still 14% lower than in 2007, before the global financial crisis. The biggest increase in log consumption in 2011 was in the CIS region, where higher production at sawmills and plywood plants in the Russian Federation and Ukraine, resulted in an increase in demand for industrial roundwood of 14%.

Removals of industrial roundwood in the UNECE region increased by 2.4% in 2011 reaching 970 million cubic metres, recording a higher percentage increase in hardwood logs than softwood logs. Higher demand for logs by sawmills in the UNECE region and a substantial increase in log exports to China, from Europe, North America and the Russian Federation, all contributed to bigger harvests in 2011. Nevertheless the rate of harvest throughout the region is well below the rate of growth of forests. Removals in 2012 and 2013 are expected to remain at the same level.

Consumption of sawn softwood posted modest gains in the UNECE region in 2011 (+2.3%) to total almost 181 million cubic metres. Increases in North America and Europe subregions were 1.0% and 2.8%, respectively, but the largest increase was in the CIS (+5.8%). Forecasts for 2012 are for a slight increase with 2013 showing growth over 1% driven by improvements in North America. Raw material costs remain a cause for concern for many sawmills in parts of Europe as well as the US west coast, where competition for logs from China is affecting prices. Europe faces a bleak short-term outlook as the fundamental drivers lack strength, and because of the poor state of the European economy.

The year 2011 was a challenging year for the European wood-based panel industry, with the decline in particle board production (-1.5%) and OSB (-5.2%). In contrast, MDF production rose by 3.7% and plywood production by more than 10%. Particleboard production in Turkey increased by 17% and fibre board by 9%. The outlook for the European wood-based panel sector is projected to decline by a further 2.6% in 2012, principally in plywood. Parts of Europe, notably Germany and Spain, experienced capacity loss in the panel sector, while Romania and Turkey showed significant increases which appear to be continuing.

Outlook and Trends (Based on UNECE/FAO Outlook Study 2010-2030)

The recently completed European Forest Sector Outlook Study II (EFSOS II), carried out jointly by the UN Economic Commission for Europe and the Food and Agriculture Organisation of the UN (UNECE/FAO 2011a), examined the range of policy options and challenges facing the forest sector up to 2030. Four policy scenarios and a reference scenario (essentially a continuation of current trends) were examined in terms of their impact on wood supply, and the provision of other goods and services by the forest sector:

[45] The UNECE region comprises three sub-regions: North America (Canada and United States), Europe (42 countries extending from Iceland to Turkey), and the CIS.

1. *Maximising biomass carbon:* explores how much carbon could be stored in the European forest by changing silvicultural methods, without affecting the level of harvest.

2. *Priority to biodiversity:* assumes that decision makers give priority to the protection of biological diversity.

3. *Promoting wood energy:* explores what would be necessary for wood to contribute to achieving the ambitious targets for renewable energies adopted by most European countries.

4. *Fostering innovation and competitiveness:* explores the consequences for the sector of a successful strategy of innovation, leading to improved competiveness

The reference scenario predicts that consumption of forest products and wood energy will grow steadily and wood supply will expand to meet this demand. Forest area is expected to continue to expand, increasing by 6%, or 12 million ha by 2030, an area slightly larger than Bulgaria. In 2030 demand for wood will be 20% higher than in 2010 with slower growth from the forest products industry and faster growth for energy. To meet this demand, all components of supply will have to expand, especially harvest residues.

Europe is, and will remain, in all scenarios, a net exporter of wood and forest products. Projections also show a steady rise in prices of forest products and wood over the whole period, driven by expanding global demand and increasing scarcity in other regions. There are also win-win opportunities in developing the use of harvest residues, recovered wood and landscape care wood (from urban and highway trees). These sources have the potential to increase by 50%, reducing waste disposal problems for society as a whole.

The national forest policy recommendations address the EFSOS II *Fostering innovation and competitiveness* scenario. The EFSOS II report states that … *this scenario could create, defend or expand markets, create new opportunities, reduce costs and increase profitability*. It goes on to say *Forest management also needs innovative approaches. Developing a culture of innovation is a complex challenge, going far beyond the boundaries of the forest sector*.

5. Impact of Afforestation Levels on Future Timber Supply

Introduction

In order to explore the impact of planned afforestation levels on the projected future roundwood volumes, a forecast model was developed. It allows for sensitivity analysis around a number of variables including (a) afforestation level including changing the initial afforestation level during the 2010-2035 period, (b) percentage of area to be thinned for both conifers and broadleaves, (c) species composition in afforestation and reforestation and (d) average yield class (merchantable volume production rate).

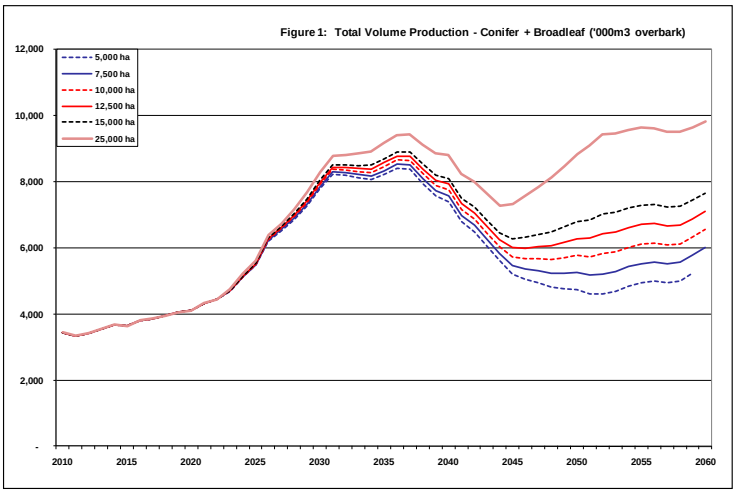
The main inputs to the model are (a) private sector planting rate, (b) the *All Ireland Roundwood Production Forecast 2011-2028*, (c) Coillte's unpublished long term forecast and (d) assumptions regarding stocking, rotation length, thinning percentage, attrition (volume loss due to windthrow, disease etc.) and yield class. The volume outputs are net of harvesting losses and are provided up to 2060. Crops are assumed to be replanted in the year following clearfell.

Afforestation Scenarios

In line with the Renewed Programme for Government document (2009), 10,000 ha per annum was taken as the baseline level of afforestation. This is increased or decreased by increments of 2,500 ha to provide five afforestation levels. To illustrate the possible level of afforestation needed to overcome the trough highlighted by Bacon (2004) a further level of 25,000 ha was included.

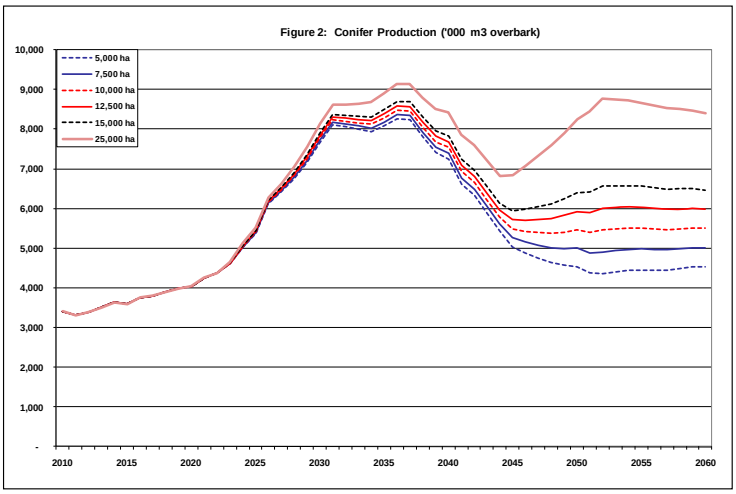
Results

Irrespective of the afforestation level, the projected total volume supply curve shows a steady increase up to 2030, followed by a smaller rate of increase to 2035 followed by a period of steady decline, which is then followed by a period of slowly increasing production (Figure 1). The peak in production in 2035 shows only minor differences between the different afforestation scenarios. However, the duration and depth of the subsequent trough in production shows major differences between the afforestation levels. The baseline of 10,000 ha peaks at almost 9 million cubic metres in 2035 but then declines by 50% to less than 6 million over a period of ten years.



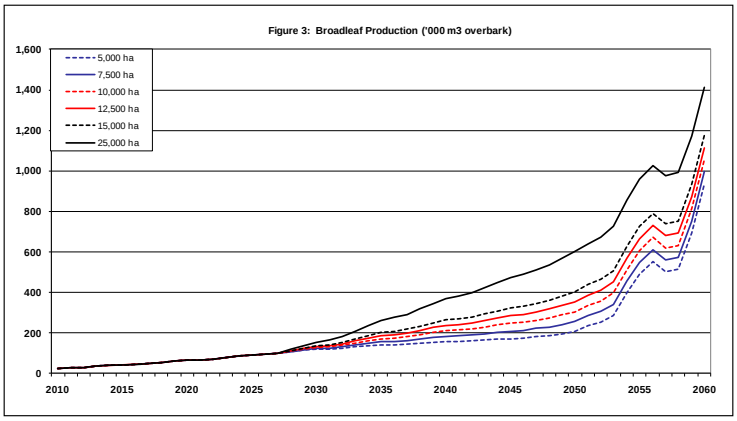
Increasing the afforestation level reduces the drop in volume production and the duration of the period of decline. Reducing the afforestation level from the baseline has the opposite effect.

A broadly similar pattern of projected roundwood volume supply is shown when only conifers are considered (Figure 2).



Due to the pattern of broadleaf planting, which has seen a steady increase over the past two decades, and the assumption that reforestation sites from the private sector will be planted with a significant broadleaf element, the projected volume supply curve for broadleaves has a quite

different shape to that for conifer volume production (Figure 3).



Broadleaf production is projected to increase at an even rate from a low base of circa 26,000 cubic metres in 2010 up to 500,000 cubic metres by 2053 and then increase more rapidly to 2057 as clearfell volumes impact followed by a one year fall and then a more rapid increase which again is due to volumes from clearfelling. Under the 25,000 ha afforestation scenario, broadleaf volumes reach 1 million cubic metres by 2055 and 1.4 million cubic metres by 2060. The model assumes a clearfell regime, which may not be entirely applicable for broadleaf crops.

Reducing the Trough and Stabilising Future Supply

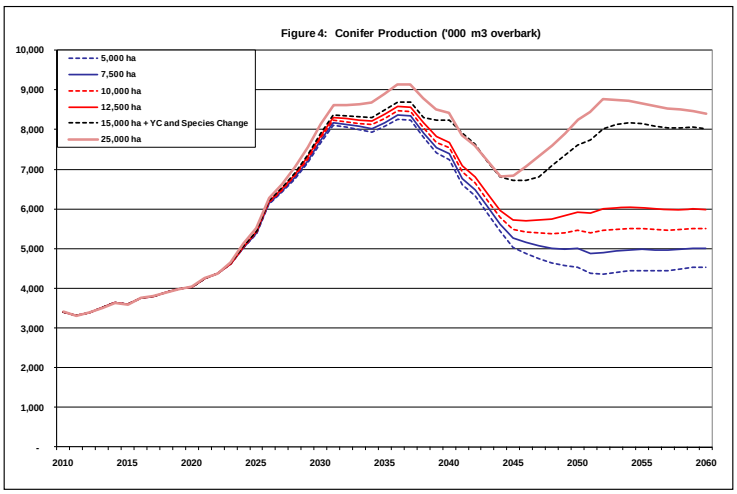
Ireland's energy policy as elaborated in the Energy White Paper 2007 and in the National Renewable Energy Plan under the Renewable Energy Directive is to develop secure sources of renewable energy up to 2020 and beyond. Wood fibre, whether derived as a by product of timber processing or as roundwood logs harvested from the forest, has a distinct role to play in addressing these policy drivers. Thus the afforestation policy outlined here from 2010 onwards will contribute to the development of secure sources of wood energy. If one takes secure to encompass sustainable then any planned afforestation should address sustainable level of future timber supply.

The achievement of a critical mass of 12 million cubic metres per annum as outlined in *Growing for the Future* is no longer realistic, given the combined impact of (a) past afforestation levels, (b) the availability of land and (c) the reduction in volume production through increased broadleaf content, increased regulatory framework and compliance with environmental guidelines. A more realistic target would be to maintain future supply within the range of 7 to 8 million cubic metres.

There are a number of factors which can impact on the depth and extent of the period of roundwood production decline from 2035 onwards. These include afforestation level, minimum average yield class and species composition.

An afforestation level of greater than 15,000 ha is probably unrealistic given past performance. This level was chosen as the highest technically feasible future planting rate.

Growing for the Future assumed an average yield class for Sitka spruce of 18. This could be increased to 20 through a combination of (a) improved planting stock and (b) excluding low-yielding site types from the afforestation scheme.



The onus on increasing the percentage of broadleaves in our forests rests somewhat unfairly on the private sector, as Coillte now undertakes no afforestation. A more balanced approach would be to set a target for 10% broadleaf for all reforestation subject to site constraints. This would ensure that the broadleaf content of the State-owned forest resource would gradually increase over time and would help create a more mixed and varied landscape.

The net result of the revised 15,000 ha afforestation programme is to significantly reduce the extent of roundwood supply decline post 2035 and also the length of time before recovery takes place. Supply now fluctuates between 7 and 8.5 million cubic metres per annum but it is sustainable in the long term.

6. Cost of Afforestation Programme and Support Schemes

Afforestation Programme

The estimated cost to implement the planned afforestation programme over the next 10 years is €732 million (Table 1) comprising €444 million in establishment grants and €288 million in premium payments.

The costs for the afforestation programme are dependent upon a number of factors and assumptions. The premium rates are linked not only to the species being planted but also to the ownership category, being lower for non farmers in addition to a reduced payment period. The costings in the table assume that farmer planting will account for 91% of afforestation. If however, the shift towards non-farmer planting as outlined is successful and the gap between farmer and non farmer premiums is reduced, then there would be a saving, the extent of which would be related to the take-up by the non-farmer category.

The species mix underpinning the table is: Sitka spruce 43.5%, other conifers (Norway spruce, Scots pine etc) 26.5% and broadleaves 30%. If however, the onus on planting broadleaves was shifted in part to reforestation resulting in a somewhat higher percentage of Sitka and other conifers in planned afforestation, then there would be a reduction in the overall cost.

Table 1: Estimated Cost of Implementing Afforestation Programme (€ millions)

Year	Afforestation Area (ha)	1st Installment	2nd Installment	1st Premiums	Total Premiums	Roads Programme (Km)	Road Grants	Native Woodlands	Total Cost	Cumulative Cost
1	10,000	27.8	-	4.2	4.2	180	6.9	1.5	40.4	40.4
2	10,000	27.8	-	4.2	8.3	180	6.9	1.5	44.6	85.0
3	10,000	27.8	-	4.2	12.5	180	6.9	1.5	48.7	133.7
4	15,000	41.8	-	6.3	18.8	180	6.9	1.5	68.9	202.6
5	15,000	41.8	9.0	6.3	25.0	180	6.9	1.5	84.2	286.8
6	15,000	41.8	9.0	6.3	31.3	128	4.9	1.5	88.5	375.3
7	15,000	41.8	9.0	6.3	37.6	128	4.9	1.5	94.8	470.1
8	15,000	41.8	13.5	6.3	43.8	128	4.9	1.5	105.5	575.6
9	15,000	41.8	13.5	6.3	50.1	128	4.9	1.5	111.8	687.4
10	15,000	41.8	13.5	6.3	56.3	128	4.9	1.5	118.0	805.4
Total	**135,000**	**375.9**	**67.7**	**56.3**	**288.0**	**1,539**	**58.9**	**15.0**	**805.4**	**805.4**

The cost for the second 10-year period of the afforestation programme will be significantly higher due to the greater area eligible for premium payments. This area is estimated as being of the order of 250,000 ha by year 20. At this stage it is only possible to provide indicative costs. The level of payment will depend on the farmer non-farmer ratio and the species mix and is likely to be within the range of €120-€160 million per annum. Grant payments again will depend on the species mix and could vary within the range of €45-€59 million per annum.

The cost for the third 10-year period will be dictated by the type of afforestation undertaken in the previous decade regards species and non-farmer participation. The cost of establishment grants would be expected to be broadly similar. The cost of premium payment would be higher as during this period the area on which premium payments will be paid will peak.

Priority Roads Programme

The all-Ireland forecast (Phillips, 2011) sets out the areas of first thinning in the private sector that must be harvested if the level of roundwood supply in the forecast is to be delivered. The Priority Roads Programme (PRP) will be implemented alongside awareness raising and educational measures among forest owners regarding the benefits of thinning and active forest management. The first phase from 2012-2016 is based on the estimated areas due for thinning under the all-Ireland forecast and will also address the backlog of forest roads in the private sector. It is assumed that by 2016, the backlog of roads will have been fully addressed and the second phase is based solely on the estimated thin areas from the all Ireland forecast (Phillips 2011).

	Years 1-5	**Years 6-10**
Area of First Thinning (ha)	45,000	32,000
Annual Road Programme (km)	180	128
Annual Cost (€ million)[1]	6.29	4.48
Total Cost (€million)	**31.46**	**22.39**

The total estimated cost of implementing the two consecutive five year phases of the PRP is €58.86 million. It is important to recognise that this is the minimum investment in roads required to leverage supplies from the private sector. It may, depending on market conditions and progress on the development of suitable harvesting infrastructure, be necessary to review the targets in the PRP and amend as required.

7. List of Submissions

An Taisce
An Taisce; The Hedgelaying Association of Ireland and The Irish Natural Forestry Foundation
Association of Irish Forestry Consultants
Cook, Ted
Cork Environmental Forum
Crann
Department of Archaeology, UCD
Department of Community and Rural Affairs and the Gaeltacht
Department of Environment, Heritage and Local Government
Department of Tourism and Sport
Donal Magner (Co-ordinator on behalf of John McCarthy, Mossie Ryan, Joe O'Carroll, Mike Glennon, John Jackson, Fr. Harry Bohan, John Brady, Michael Guilfoyle, Michael Lynn and Duncan Stewart
Donegal Woodland Owners
Eastern Regional Fisheries Board
Environment and Water Services, Clare County Council
Failte Ireland
Farrelly Brothers
Forestry Assessment Companies
Gallagher, Gerhardt
Gilligan, Shane
Gowran, Joe
Grandon, Robert
Hussey, Brian
Irish Farmers' Association (IFA)
Irish Forestry and Forest Products Association (IFFPA)
Impact Trade Union – Coillte Branch
Irish Peatland Conservation Council
Irish Wind Energy Association
Irish Timber Growers Association (ITGA)
Keep Ireland Open
Macroom District Environmental Group
National Parks and Wildlife Service
North Western Regional Fisheries Board
Pro Silva Ireland
Reps of private sector
South Tipperary County Council
Sustainability Institute of Ireland
Teagasc
Teak 21
The Heritage Council
Tong, Alec
Voice
Walkers Association of Ireland
Western Regional Fisheries Board
Woodlands of Ireland

Glossary

The Silvavoc system provides a comprehensive dictionary of forestry terms at http://www.iufro.org/science/special/silvavoc/silvaterm/query-silvaterm-database.

Afforestation	Forest establishment on land not previously carrying forest
Biodiversity	The diversity of life on earth, including diversity within species (genetic diversity), between species and of ecosystems
Carbon sequestration	The storage of carbon by forests and soils during growth and soil development
Discount rate	The rate at which money received or spent in the future loses value when valued in present day terms
Exotic species	Non-native species
Genetically improved planting material.	Tree reproductive material derived from the selection and breeding of superior individual trees chosen for their productivity, wood quality and stem form.
GIS	A computerised mapping system that can incorporate several layers of information such as location, soils, tree species for display and analysis.
MDF	Medium density fibreboard
[age of] MMAI	The age at which the average annual roundwood volume growth of a forest crop reaches its maximum
Net realisable volume	The estimated roundwood volume that will potentially be available to the enduser
OSB	Oriented strand board
Rotation	The length of time (expressed in years) between forest establishment or regeneration and final felling
Thinning	The removal of a proportion of immature and/or poorly formed trees from a forest in order to improve the growth of the remainder and the overall quality of the forest area
Yield class	A measure of site productivity expressed as cubic metres roundwood /ha/yr at the age of MMAI

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Review of State Assets and Liabilities

Recommendations of Review Group on Coillte

The Review Group recommends that the government should proceed to dispose of Coillte as a going concern, but with the proviso that Coillte would be sold with long-term leases to the use of forest land with ownership of the land remaining with the State. The option of selling the harvesting rights but retaining ownership was employed in New Zealand and Australia in the 1990s. The New Zealand Crown Forestry Licence may provide a possible model which could be modified to Irish conditions. We view the retention of land ownership and the use of leases rather than outright sale as an appropriate instrument to ensure the continuation of the multiple benefits of forestry. Were this recommendation to be accepted, then the State agency set up to manage the ownership of Coillte's forest land might also be considered as the appropriate agency to manage the ownership of bogs retained following a possible privatisation of Bord na Móna (see Section 10).

While we do not recommend in principle the sale of forest land, Coillte possesses a substantial land area which is not forested and which may never be forested. Coillte should be encouraged to accelerate its disposal of that part of its land bank which is surplus to its immediate commercial requirements in its own business, as recommended by the Report of the Special Group on Public Service Numbers and Expenditure Programmes, with the proceeds being remitted to the Exchequer by way of special dividend.

Another option would be to keep Coillte as a forest company but to dispose of its non-core activities, particularly the two board mills. There is no obvious rationale for State involvement in the business of operating panel board manufacturing facilities. This option could include the sale of Coillte's telecommunications business, which involves the lease of sites for telecommunications masts and more recently the construction by Coillte of its own masts and the lease of antenna space to telecommunications companies.

Recommendation 32: The Group recommends that the State should initiate the disposal of Coillte's forest and non-forest assets (but not its forest land), possibly using the New Zealand Crown Forest Licence template modified to make it suitable to Irish conditions. Unforested land surplus to Coillte's requirements should be sold and the proceeds remitted to the Exchequer by way of special dividend.

Concerns over Coillte's market power in the sale of logs can be addressed by suitable provisions in sale agreements. The issue of public amenity and access can be dealt with in the license conditions. We believe that this option best realises the return to the taxpayer from the State's investment in forestry over decades, while protecting the legitimate concerns for recreational access to State-owned forest land, biodiversity and environmental sustainability.

Irrespective of the ownership decision, Coillte is now managing a static forest estate in which the only planting is reforestation of cut-down areas. The requirement to re-afforest is a long standing one and applies to all recipients of grant aid for forestry and not only Coillte. We consider this restriction to be unjustified and counter-productive. There will be fears that removing this requirement might lead to a reduction in the forest area. But forests are a means to an end, not an end in themselves. Provided that forests can be fully compensated for the multiple benefits they provide, there is no case to intervene further in the forestry market, particularly when national resources are so limited. Indeed, the replanting requirement may have the perverse result of reducing rather than increasing the forest area. Survey results indicate that farmers' apprehension that once land is planted to forestry it can never be taken out of forestry is one of the strongest disincentives to farm afforestation. Removing this requirement would lead to a significant improvement in the incentives for new planting, and thus the prospects of meeting government targets, without requiring any increase in exchequer expenditure.

Recommendation 33: The Review Group recommends that the replanting obligation attached to Coillte and grant-aided forestry should be discontinued.

On the subject of sequestration discussed earlier, the Review Group notes that the Renewed Programme for Government (October 2009) committed to working with the Irish forestry sector, including Coillte, to develop a scheme through which some of the monies currently set aside to purchase carbon credits abroad would be diverted for forestry investment in Ireland. The outline proposal was for the taxpayer to fund carbon offsets, using funds which would otherwise be used to purchase carbon credits over the period 2013-2020. Given the pre-existing level

of public support for private forestry, the Group does not favour adding further to this support by adding a carbon sequestration payment. However, there would be merit in restructuring these incentives to explicitly recognise the carbon sequestration value. In the case of publicly-owned and -funded forestry, any proposal to introduce a carbon offset scheme for forestry should be confined to new planting after 2013.

Recommendation 34: The Review Group recommends that, in order to minimise the national cost of climate policy, activities that sequester carbon should be treated equally to those that emit carbon. The Group supports efforts to reward forest owners for the value of carbon sequestered by new forests after 2013. For farmers in receipt of the current range of financial incentives, we recommend that these incentives be restructured to explicitly reward the carbon sequestration value but there is no justification for a further increase in these payments.

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