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# Market Report on Irish Organic Waste Management and Compost Use



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Comhshaol, Pobal agus Rialtas Áitiúil  
Environment, Community and Local Government



## Market Report on Irish Organic Waste Management and Compost Use

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## Market Report on Irish Organic Waste Management and Compost Use

Published by rx3

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## EXECUTIVE SUMMARY

This report presents information about the Irish compost production and use sectors.

There are approximately 45 composting facilities operational in Republic of Ireland in May 2012, and approximately 16 composting facilities that are not currently operational. The operational facilities have an estimated 377,700 tonnes of operational capacity. 28 composting facilities surveyed by EPA processed 269,000 tonnes of waste in 2010, producing an estimated 107,680 (40%) tonnes of compost. During 2010, 43,139 tonnes household organic waste was collected by local authorities and 20,698 tonnes by the private sector, with a further 63,837 tonnes collected at civic amenity centres and bring centres. Gate fees for both food and green waste achieved at composting facilities are reported to have been on a downward trend since 2006. Intertrade Ireland (2011) estimated employment in the composting industry on the Island of Ireland in 2009 at 363 people directly employed and a further 2,573 indirectly employed, based on processing capacity of 508,560 tonnes.

There are five non-industrial-process anaerobic digestion facilities processing manures and off-farm feedstocks operational in Republic of Ireland in May 2012. The operational facilities have an estimated 35,000 tonnes of total operational capacity. Three mushroom compost production facilities are listed.

Irish biowaste management facilities listed at [www.rx3.ie/Irish-Composting-Facilities-Map](http://www.rx3.ie/Irish-Composting-Facilities-Map).

Fifteen composting facilities operators in Ireland were surveyed during late 2010 for information about compost markets, compost sales routes and perceived industry barriers. The facilities reported market shares as follows; landscaping, 24%; agriculture, 29%, amateur gardening 18%; horticulture 21%; landfill capping 7%; grounds maintenance 1%. Over two thirds of compost produced was sold, with 12% distributed at a loss, 5% distributed free and 16% used onsite. Barriers identified by the composting production sector can be grouped as being related to poor awareness (about contamination by householders, about compost properties by potential users, especially farmers and the public) and to regulatory issues relating to planning and the Animal By-products Regulation.

The report presents data about five Irish sectors that use compost products - agriculture and organic farming, horticulture, retail, landscaping and forestry and brownfield and contaminated land. Information for the market sounding was collected by using telephone interviews. Stakeholders were identified using trade organisation membership and government lists and companies own advertising through published literature, internet searches. The survey of a range of sectors: retail, landscaping & forestry, horticulture, agriculture and organic farming, and the brownfield and contaminated land sector was conducted as a series of interviews at appropriate industry events or telephone interviews.

The report presents data about each sector, identifying use of compost in the sector, level of awareness of compost and other recycled organics, barriers to compost usage, and quantifies actual and potential compost use in each sector.

Current and potential markets for compost are identified, including specialist sectors like horticultural clusters which could consume specialist compost products. Mean European compost sales prices are also identified, which may signal relative or potential Irish prices.

The report indicates that total compost consumption, currently 190,000 tonnes, could be increased to over 500,000 tonnes by production increases and consequent appropriate market development.

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## ABBREVIATIONS USED

AFOR - Association for Organics Recycling  
BMW - Biodegradable municipal waste  
CSO - Central Statistics Office  
ECN - the European Compost Network  
GAP - Good Agricultural Practice  
MSW - Municipal Solid Waste  
NWR - the EPA National Waste Report  
SMC - Spent Mushroom Compost



# 1 INTRODUCTION

## 1.1 Background

Following the adoption of the 1996 Waste Management Act and the publication of “*Changing our Ways*”<sup>1</sup> in 1998, waste management infrastructure in Ireland has developed significantly.

Ireland, which was a landfill nation with little or no focus on recycling or recovery, now has strong collection and sorting systems in place. Ireland recycled 166,684 tonnes in 1998 and 1,084,070 tonnes of municipal waste in 2010. Thus, 12 years has seen a significant improvement in our recycling rates.

One of the challenges currently facing the Irish system is the lack of internal markets for recyclables. This was identified in the 2002 Government policy statement “*Delivering Change*”.<sup>2</sup> This statement identified Ireland's lack of stable and economically attractive markets and outlets for recyclable materials as one of the main barriers to an improved and sustainable recycling performance. This observation led the Department of Environment, Heritage, and Local Government (DOEHLG) to establish the Market Development Group (MDG) in July 2004.

The MDG published the *Market Development Programme for Waste Resources: 2007-2011* that laid out a 5 year plan to facilitate the market development of recyclables. The Programme implementation was officially started in October 2008 and is now implemented under the name “rx3”.

## 1.2 Requirements of the market development programme

Project C002 of the Market Development Programme requires delivery of a project described as follows.

**Long Term Objective** *A market sounding exercise: to identify and engage with stakeholders; to advertise the objectives and aims of the MDG Programme within the industry; and to gather baseline information in relation to awareness, technical knowledge, attitudes and barriers etc. to compost usage in individual sectors in Ireland. This will supplement the surveys conducted within the ERTDI report “Assessment and Evaluation of Outlets of Compost Produced from Municipal Waste”, 2002 [“Assessment and Evaluation of Outlets of Compost Produced from Municipal Waste”] which served to identify composting infrastructure and some users of compost and other organic amendments.*

### **Stage 1: Survey of the Landscaping and Forestry Sector**

*All stakeholders within this sector such as compost producers, users (landscape architects, landscape contractors, garden designers etc.) retailers and industry bodies will be identified (using the MDG database and other relevant means) and surveyed.*

### **Stage 2: Survey of the Horticulture Sector**

*All stakeholders within this sector such as compost producers, users (commercial growers, nurseries, growing media manufacturing companies etc.) retailers, industry and regulatory bodies will be identified and surveyed.*

### **Stage 3: Survey of the Agricultural and Organic Farming Sector**

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<sup>1</sup> Department of the Environment, Community & Local Government, 1998. A Policy Statement: Changing our Ways

<sup>2</sup> Department of the Environment, Community & Local Government, 2002. A policy Statement: Delivering Change

All stakeholders within this sector such as compost producers, users (IFA, Irish Tillage and Land Use Society (ITLUS), IOGFA), retailers, industry and regulatory bodies (Teagasc, DOA, etc.) will be identified (using the MDG database and other relevant means) and surveyed.

#### **Stage 4: Survey of Brownfield and Contaminated Land Sector**

All stakeholders within this sector such as compost producers, users, remediation companies, consultants, retailers, industry and regulatory bodies will be identified (using the MDG database and other relevant means).

For each of these 4 stages, the purpose is to:

- Gain understanding of level of awareness amongst stakeholders in relation to compost usage
- Determine the actual usage and outlets for compost in this sector
- Gain an understanding of the barriers to compost usage
- Estimate quantities of compost that could be used in this sector if barriers are overcome
- Add new stakeholder contacts and company information to the MDG Database

**Deliverable** Report detailing:

- Stakeholders attitudes and knowledge towards compost usage;
- Identification of projects/areas that are suitable for future growing trials;
- Estimates of potential market size and value of compost products.

### **1.3 Objective**

The objective of this study is to generate data about the current state of the market for organic waste derived materials and the potential for growth; to identify and engage with stakeholders; to advertise the objectives and aims of the rx3 Programme within the industry; and to gather baseline information in relation to awareness, technical knowledge, attitudes and barriers etc. about compost usage in individual sectors in Ireland. This will update the surveys conducted within the Report “Assessment and Evaluation of Outlets of Compost Produced from Municipal Waste” report “Assessment and Evaluation of Outlets of Compost Produced from Municipal Waste”, 2002 which served to identify composting infrastructure and some users of compost and other organic amendments.

Additions to the outline identified in the Market Development Programme are necessary. The retail sector has a direct influence on compost market penetration. For that reason, a survey of the retail sector was also conducted.

## 2 COMPOST PRODUCTION SECTOR

The primary objective of this report is to generate data about the state of the market for organic waste derived materials and the potential for growth. However, an additional review of the compost production sector was required.

This chapter presents data about the compost production sector in Ireland, primarily using published data, but also using data gathered about the sector from direct contacts with compost producers.

### 2.1 Methodology

The data collection included primary data collection using telephone surveys to complete questionnaires in Appendix B. Fifteen large composting facilities responded.

The questions for composting facility operators were structured into sections as follows:

- Section A - Contact details
- Section B - Composting site operations
- Section C - Products, markets and use
- Section D - Other comments

The authors completed these elements with known data where available. Where published data was not available, respondents completed those sections relevant to them via telephone interview. The questionnaire is quantitative, with questions requiring either figures or responses to categorised answers (tick boxes). There are few open ended questions, where clarification or opinions was sought and respondents may add general comments.

Secondary data collection consisted of reviewing publicly available information. The information reviewed included: facility waste licences, EPA National Waste Report Series<sup>3</sup>, EPA National Waste Report Factsheet, Facility AERs, industry data and company websites.

Data collected about composting facilities was compiled as follows;

- Name and county for each composting facility
- Facility waste licence status and facility animal by-products status
- Number of facilities in animal by-products regulatory approvals process
- Main types of materials processed
- Tonnages licensed or processing capacity reported or estimate
- Type of composting technology used
- Product types produced and estimated proportions of each (based on interviews)
- Quality system used (quality assurance scheme or quality standard)
- Published product sale prices

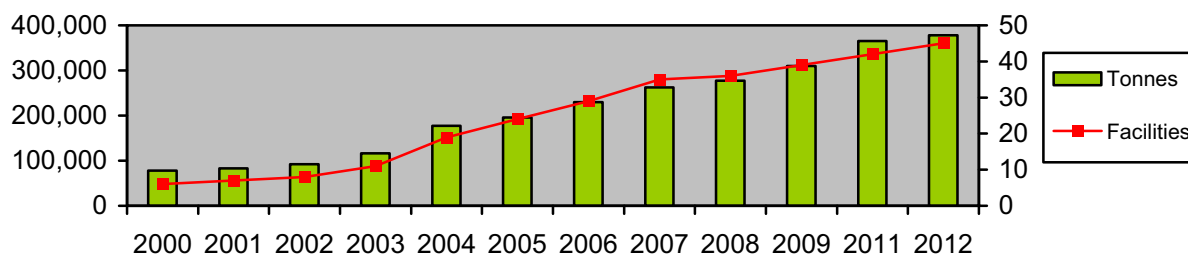
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<sup>3</sup> [www.epa.ie/downloads/pubs/waste/stats/](http://www.epa.ie/downloads/pubs/waste/stats/)

## 2.2 About the production sector

### 2.2.1 Details of composting facilities

The number of composting facilities in Republic of Ireland has grown in the past decade - see figure 1. In 2012, 45 composting facilities with estimated operational capacity of 377,700 tonnes operate in the Republic of Ireland. For a list of these facilities, see Appendix E.



**Figure 1: Number of and approximate operational capacity, composting facilities 2000-2012**

Approximately 16 developed composting facilities are not operational in April 2012.

Seven composting facilities are reported operating in Northern Ireland.

In May 2011, approximately 600,000 tonnes of treatment capacity for brown bin and organic fines was reported to be in planning and development, split approximately 50:50 between composting and anaerobic digestion capacity.<sup>4</sup>

### 2.2.2 Details of mushroom composting facilities

Three mushroom composting facilities had a reported total licensed and permitted capacity of 111,850 tonnes in 2011.

**Table 1: Mushroom compost production facilities in operation in Ireland in 2011**

Facility name	Waste License	Licensed capacity (tonnes)	Primary Waste types accepted
Kabeyun Ltd- Monaghan Mushrooms	W0121-01	15,600	Manure
Carbury Compost Ltd.	W0124-01	56,500	Manure
Custom compost	W0123-01	39,750	Poultry Litter, Horse Manure, Gypsum

<sup>4</sup> Presentation to Cré AGM, May 2011, Conor Walsh, Technical Director, SLR.

### 2.2.3 Anaerobic digestion facilities

A number of anaerobic digestion facilities do process, or have processed, organic waste and a further number of anaerobic digestion facilities are in development in Ireland. Further anaerobic digestion development is expected as a result of improved REFIT rebates implemented during 2012 by the Department of Energy.

**Table 2: Anaerobic digestion facilities operating in Ireland, status in 2012**

Facility name	License and ABPR permit	Licensed capacity (tonnes) <sup>5</sup>	Primary Waste type
Beofs (Kilkenny)	Waste permit COMP - 8	(10,000)	Manure
Berridge (Waterford)	Waste permit	5,000	Manure, biosolids, commercial waste
Methanogen (Waterford)	Waste permit	(10,000)	Manure
McDonnell (Limerick)	Waste permit COMP - 55	(10,000)	Manure, commercial waste
Roughly Valley Co-operative, Co. Kerry	Waste licence COMP-77		Manure

Anaerobic digestion facilities, exclusively processing wastes generated onsite or exclusively processing sewage (e.g. Ringsend or Tullamore WWTPs) do not operate as merchant facilities for municipal waste or commercial waste so are not listed.

A number of anaerobic digestion facilities are in the development process, ranging from concept stage through to commissioning. This includes facilities listed in Emerging Infrastructure Report IWMA, 2011; three Greenstar facilities Sligo, Cork; Joe Barry, Summerhill; Greenport Environmental, Foynes; Panda, Slane, Co. Meath, Stream Bioenergy, Dublin.

The animal by-products section of this document reports the numbers of anaerobic digestion facilities that have applied for Department of Agriculture, Fisheries and Food approval to process animal by-products. See animal by-products section of this report.

At least five anaerobic digestion facilities do or have operated in Northern Ireland at Waringstown, Coleraine, Cloughmills, Toomebridge and Portglenone. These facilities primarily process manures and silage effluent and some facilities process waste. There is a surge in interest in anaerobic digestion in Northern Ireland, as a result of the ROCs rebate system. The ROCs system, at current prices currently offers nearly double the REFIT rate.

<sup>5</sup>Waste licence capacity is as outlined in the EPA facility waste licence. For facilities operating under local authority waste permit, an estimate of 10,000 TPA is used.



## 2.2.5 Quantifying organic waste treated, volumes and types

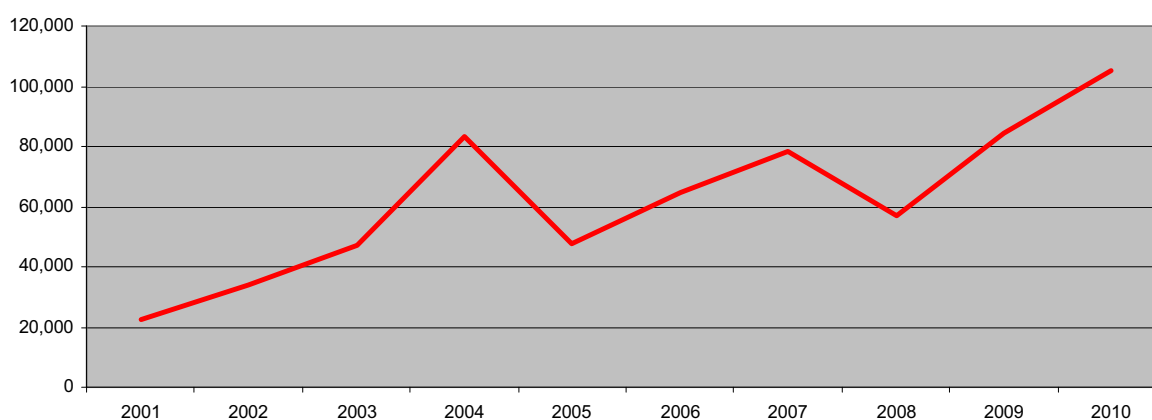
The 28 facilities surveyed for EPA NWR 2010, recycled 269,200 tonnes organic waste, while the 30 facilities surveyed for EPA NWR 2009, recycled 301,793 tonnes organic waste. The breakdown by material is shown in table 4 and in figure 3.

**Table 3: Wastes composted at selected facilities, 2009 and 2010**

"Type"	EWC	EWC description of waste production source	2009	2010
"Industrial"	02 01	Agriculture, horticulture, aquaculture, forestry, and fishing	65,729	52,196
	02 02	Preparation & processing of meat, fish & foods of animal origin	6,037	7,031
	02 03	Fruit, vegetables, cereal etc. Preparation and processing	5,282	1,502
	02 05	Dairy products industry	9,851	12,600
	02 06	Baking and confectionery industry	482	232
	02 07	Production of alcoholic and non-alcoholic beverages ...	26,124	23,680
	03 01	Wood processing and the production of panels and furniture	65	943
	03 03	Pulp, paper and cardboard production and processing	1,932	1,896
	04 02	Textile industry	52	149
	07 01	MFSU basic organic chemicals	1,107	852
	07 05	MFSU of pharmaceuticals	3,916	3,582
	07 06	MFSU of fats, grease, soap, detergent, disinfectant & cosmetic	616	520
	10 01	Fly ash from peat and untreated wood	25	
"C&D"	17 08	Gypsum-based construction material	4,815	140
"Sludges"	19 05	Aerobic treatment of solid wastes	382	
	19 08	Waste water treatment plants not otherwise specified	53,814	56,853
	19 09	Preparation of water for human consumption or for industrial use	2,900	322
	19 12	Mechanical treatment of waste	34,144	1,647
Municipal	15 01	Packaging (& separately collected municipal packaging wastes)	1,882	11
	20 01	Municipal wastes (separately collected fractions) except 15 01	48,373	73,695
	20 02	Garden and parks wastes (including cemetery waste)	32,508	30,238
	20 03	Other municipal wastes	1,758	1,112
		<b>TOTAL</b>	<b>301,793</b>	<b>269,200</b>

In 2010 43,139 tonnes household organic waste was collected by local authorities, 20,698 tonnes by private sector, and 63,837 tonnes at civic amenity centres and bring centres.

Despite falls in total wastes recovered, the EPA National Waste Report series indicates that BMW recovery has increased 4-fold since 2001 - see figure 3.



**Figure 3: Total BMW recovered, as reported by EPA National Waste Report series**

## 2.2.6 Organic waste available to collect or treat in Ireland

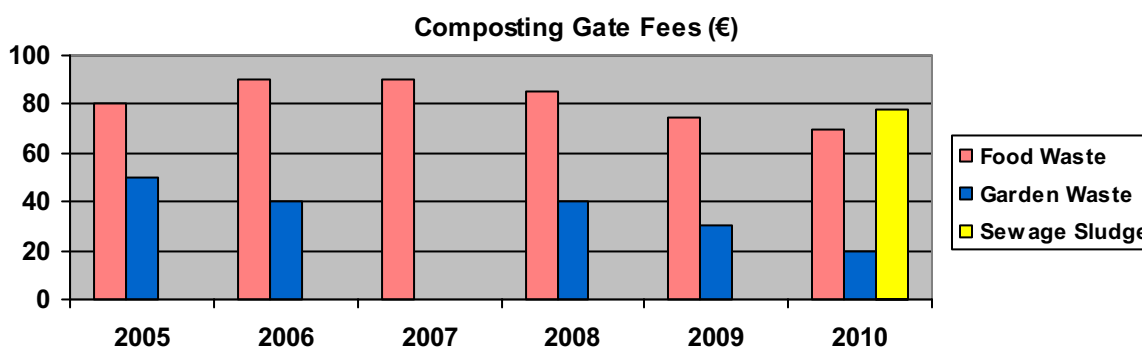
Estimates of organic waste available are shown in Table 4, categorised by type.

**Table 4: Organic waste available in Ireland as estimated by different bodies**

Waste "type"	Intertrade Ireland 2011 <sup>6</sup>	Cré 2010 <sup>7</sup>	Sustainable strategies 2010 <sup>8</sup>
Industrial	597,816		460,000
Commercial	331,691		
Municipal	654,000	Food 358,267 Green 284,494	780,000
<b>Totals</b>	<b>1,583,507</b>	<b>518,369 to 642,761</b>	<b>1,240,000</b>

## 2.2.7 Gate fees charged for composting

Figure 4 below depicts the average gate fee reported at composting facilities 2005 - 2010. Gate fees vary depending on the facility location and the quantity and quality of waste offered, delivery mechanism etc., so the prices reproduced here are estimated national averages. Published data is not yet available for anaerobic digestion gate fees.



**Figure 4: Composting facility gate fees in Ireland<sup>9</sup>**

Gate fees to 2010 were falling, possibly due to market competition for waste from landfill.

## 2.2.8 Employment in the Irish composting industry

Intertrade Ireland (2011) estimated employment in the composting industry on the Island of Ireland in 2009 at 363 people directly employed and a further 2,573 indirectly employed, based on processing capacity of 508,560 tonnes. This suggests that one job is created per 1,377 tonnes of composting capacity provided (0.72 jobs/1000 tonnes capacity). The report extrapolates the potential employment in the sector on the island of Ireland with projected infrastructure development and suggests that over 1,000 people could be directly employed in the sector.

The Intertrade Ireland job creation estimates reflect the current mix of smaller local and centralised facilities. If larger centralised facilities develop, this may lead to lower

<sup>6</sup> Intertrade Ireland, 2011: Market Report on Composting and Anaerobic Digestion \*(All Island Study)

<sup>7</sup> Cré, 2010, Collectable Source Separated Household Food Garden Waste in Ireland

<sup>8</sup> Sustainable strategies for biomass use in the European context, 2010, indicates likely availability of 350,000 tonnes straw, 61,150,000 tonnes excrements & litter, 620,000 tonnes other harvest residues and 10,000 tonnes sewage sludge.

<sup>9</sup> Inter Trade Ireland, 2005, 2006, 2009 - Market Report Composting and Anaerobic Digestion Sector; Forfás Waste Benchmarking Analysis, 2007 and Policy Priorities 2008; RPS survey, 2010.



employment rates. US data<sup>10</sup> suggests one job is created per 2,500 tonnes of composting capacity provided.

Nevertheless significant employment and investment in the sector is likely with the capacity expansions that are projected in national targets.

### 2.2.9 Animal by-products regulation

The Animal By-products Regulation 1069/2009 and SI 142 of 2011 lays down health rules concerning animal by-products not intended for human consumption. The purpose of the legislation is to safeguard human and animal health by controlling the use and disposal of animal by-products.

The legislation pertaining to compost plants aims to ensure that all products of animal origin treated by composting meet the required treatment standards to ensure pathogen reduction and that recontamination is prevented, so treated material may be safely applied to land. This regulation is therefore a key requirement for compost production sector facilities treating animal by-products.

The Department of Agriculture, Food and Fisheries has approved twelve composting facilities and three anaerobic digestion facilities to process animal by-products by. An estimated 181,000 tonnes of animal by-products composting and anaerobic digestion treatment capacity is approved to operate. These facilities are listed in table 5.

**Table 5: Organic waste management facilities approved to process animal by-products**

Name	Technology	Approval Number
Athchursail Arann, Aran Islands, Co. Galway	Composting	COMP - 19
Ballybeg Composting, Littleton, Co. Tipperary	Composting	COMP - 45
De Brún Iasc Teo, Dingle, Co. Kerry	Composting	COMP - 57
Enrich Environmental, Kilcock, Co. Meath	Composting	COMP - 58
Envirogrind Ltd, Pettigo, Co. Donegal	Composting	COMP - 7
Galway City Council, College Road, Galway	Composting	COMP - 35
Johnstown Recycling Co. Westmeath.	Composting	COMP - 36
Kilmainhamwood Compost, Co. Meath	Composting	COMP - 6
McGill Environmental, Glenville, Co. Cork	Composting	COMP - 31
Milltown Composting, Fethard, Co Tipperary	Composting	COMP - 15
O'Toole Composting, Fenagh, Co. Carlow	Composting	COMP - 24
Waddock Composting, Killamaster, Co. Carlow	Composting	COMP - 16
BEOFFS, Ballytobin, Callan, Co. Kilkenny	AD	COMP - 8
Roughy Valley Co-operative, Co. Kerry	AD	COMP - 77
McDonnell Farms, Shanagolden, Co. Limerick	AD	COMP - 55

The approval process for a composting or anaerobic digestion facility to treat animal by products is a staged process. A number of facilities were at stage 1 or conditional approval of the approvals process in May 2012. The numbers at each stage are presented in table 6.

**Table 6: Numbers of facilities seeking approval to process animal by-products (May 2012)**

Technology	1 <sup>st</sup> Stage	Conditional approval/validation	Approved	Total
Composting	6	5	12	23
Biogas	6	10	3	19

<sup>10</sup> FoE Europe, 2010, More jobs, less waste

### 2.2.10 Quality standards in the composting sector

In Ireland, centralised composting and anaerobic digestion facilities apply product quality standards from the facility waste licence. This standard defines thresholds of certain parameters including potentially toxic elements, physical contaminants, pathogens and stability. The standards applied are most often derived from the European Commission Working Document on Biological Treatment of Biowaste 2nd Draft.

Some facilities produce compost conforming to specific industry product specifications. The lack of a national compost product standard was recognised as a barrier to compost market development. Therefore in 2009, at request of rx3, NSAI started the development of a National Compost Quality Standard. Irish Standard 441 (IS441) “*Quality requirements for compost manufactured from separately collected biodegradable materials*” was published in mid-2011. See [www.rx3.ie/National-compost-quality-standard](http://www.rx3.ie/National-compost-quality-standard) for details.

### 2.2.11 Quality assurance in the composting sector

A quality assurance scheme is a market-oriented step that goes beyond the adoption of National Compost Quality Standards. Market driven quality schemes can impact positively on collection and treatment of organic waste and on quality of the end-product itself. This, and a quality mark/logo/label, instils confidence in consumers as to the quality and contents of compost products.

Ireland has not had a national compost quality assurance scheme, nor is a pan-European quality assurance scheme operational, nor are any Republic of Ireland composting facilities certified to PAS 100.

Some facilities report producing high-quality compost products according to quality assurance scheme measures without being accredited to them. The lack of a compost quality assurance scheme was recognised as a barrier to compost market development. The composting industry has indicated that it requires a compost quality assurance scheme to aid market development.

In response to these issues rx3 appointed contractors Certification Europe to develop a compost quality assurance scheme. This project has developed scheme documentation which is followed by a trialling period of 12 months to mid-2012. From mid-2012 there will be a pilot operation phase of 12 months, when composting facilities will be certified. The compost quality assurance scheme logo, figure 5, will be widely marketed.

See [www.cqas.ie](http://www.cqas.ie) for details.



Figure 5: Quality assurance scheme logo

### 2.2.12 Markets used by the Irish composting sector

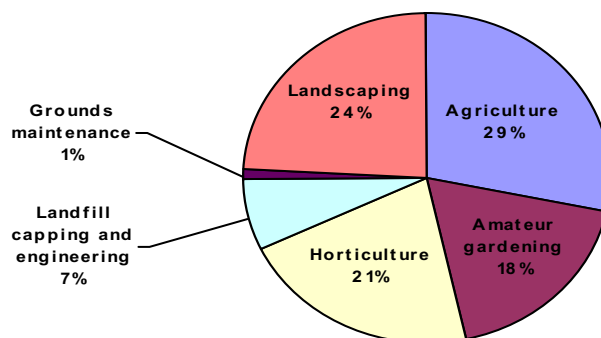
Data about Irish compost markets from 2006 is presented in Appendix C.

## 2.3 rx3 survey of compost producers

### 2.3.1 Main markets identified

rx3 surveyed selected fifteen Irish composting facility operators during November 2010.

These facilities surveyed represented 50% of the main, active, large composting facilities. The survey asked operators about the main markets for compost sold from the facility. Facility operators were asked what the main markets, in tonnes each, were for the compost produced by their facilities. Responses are depicted in Figure 6.



**Figure 6: Distribution of compost reported, of total produced**

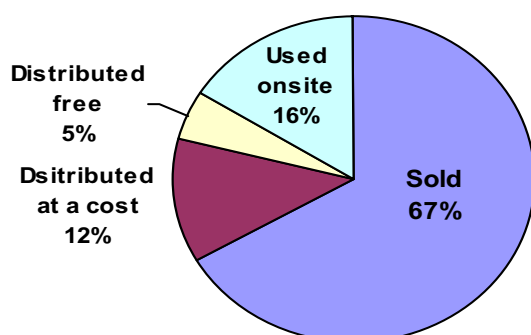
The survey response indicated that the most common applications for compost produced were in the agricultural, landscaping, horticulture (including peat dilution) and amateur gardening sectors

Respondents asked about future markets for organics products, suggested that the agriculture sector offers the most significant growth potential.

These reported market shares are similar to those reported for 2006 by Intertrade Ireland. A small number of companies are or have been involved in export of compost products, primarily producing either peat dilution product or low-volume, high-value niche products. A number of facilities produce product specially designed for use in sports grounds and golf courses and other high-value niche markets. Some of this material has, in recent years, found export markets in Dubai, Greece, UK and Germany.

### 2.3.2 Compost sales routes

The rx3 market survey of composting facilities asked operators if charges were applied to compost distributed from their facility. Figure 7 outlines the response reported, estimating the % of compost sold, compost used on site, distributed free and distributed at a cost.



The majority of facilities reported selling the compost produced. Some facilities reported distributing compost produced free of charge to householders that use the green waste facilities and kerbside collection services. This encourages feedstock delivery by the public and an understanding of the circular nature of the process.

**Figure 7: Reported compost value by survey response**

Lack of storage space for finished compost, and the dynamics of seasonal pressure on treatment and storage space can lead to compost distribution at reduced prices or without

charge or even at a cost to the composting facilities due to transactions occurring at less optimum times.

Some facilities offer agricultural markets a combined compost delivery and land spreading service as part of their compost distribution arrangement.

Organic wastes and manufactured composts are bulky, so transport and distribution costs limit the distances over which it is feasible to move both feedstock and final products. Compost products have a relatively low value compared with other recovered materials and margins for businesses operating in the industry are tight. As a result, treatment facilities tend to be located close to feedstock supplies, the end-markets tend to be local, and the products and end users vary by region. Products targeted at sectors such as horticulture, landscaping and sports turf do offer higher values, which is reflected in increased regional and national distribution of these products. The presence of horticultural clusters suggests a market for composting facilities to target.

### 2.3.3 Barriers to compost market development

Composting facility operators were asked about the barriers to compost market development identified by compost producers. The main barriers identified by compost producers are as follows:

#### Awareness issues

- Contamination of brown bins, especially the domestic brown bin making it difficult to produce clean quality compost.
- The main market for compost produced in Ireland is in the agricultural industry. Further awareness of the advantages of using an organic material over a chemical fertiliser needs to be developed within this sector.
- Farmers need assurances that an organic material can do as good job than chemical fertilisers. This requires development and marketing of a quality assurance scheme.
- Public perception of biowaste materials is important. A number of sites operate systems where waste producers drop off green waste and collect compost. This creates a closed circle increasing awareness of the benefits of recovering organic material. This helps improve public perceptions, of food waste, garden waste, sludges as a valuable resource.

#### Regulatory issues

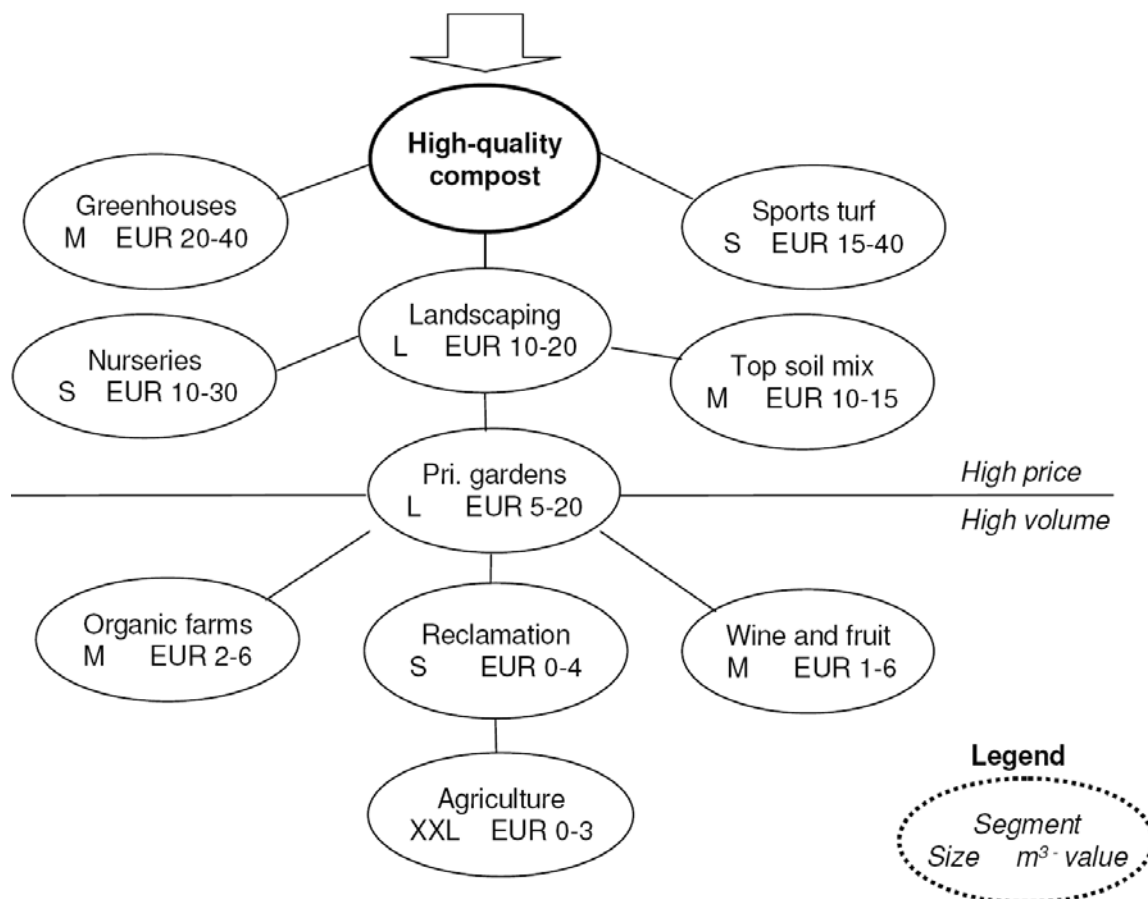
- Respondents noted difficulties in complying with the Animal By-products Regulation approval process, noting that the process was time-intensive and expensive. The process was described as "*over-regulated*".
- Regulatory processes can be lengthy, inconsistent and expensive to navigate.
- The landfill levy needs to be further increased to divert biowaste from landfill.

### 3 COMPOST USE SECTORS

#### 3.1 Background - compost markets identified in other studies

##### 3.1.1 European and UK markets for compost

Looking at the makeup of other markets may help understand where markets for compost might develop in Ireland. The European Compost Network (ECN)<sup>11</sup> described size type and value of European compost markets as shown in figure 8.



**Figure 8: Values and size of markets for compost in Europe**

*Note: Market volume is indicated as relative size (small (S) to extra-extra-large (XXL)) of the market segment. Prices are known ranges for compost products within the market segment (EUR/m<sup>3</sup>).*

Regional differences across Europe mean that conclusions must be carefully considered. For instance, the large reliance on agriculture shown in the figure may reflect heavier use of this market in Southern Europe. Thus, this and other elements of this description might not apply to Ireland.

In 2008/09, 2.8 million tonnes of compost were commercially produced in the UK. Of this, 35% was sold to end users, 20% was sold to retailers, 23% was used on the site of production and 20% was distributed free of charge. These proportions have remained constant from previous years despite recent rapid growth in compost production.

<sup>11</sup> ECN, 2008, European Compost Production and Use in EU.

Table 7 identifies the market shares of compost products from source segregated feedstock manufactured in the UK, 2008/09.

**Table 6: Market share of compost products manufactured in the UK, 2008/09**

Product	Market share
Soil conditioner (0-25 mm for compost, 0-40 mm for agri-applications)	81%
Mulch	5%
Topsoil / subsoil manufacture	5%
Growing medium	6%
Turf (top) dressing	2%
Solid biofertiliser or Concentrated liquid fertilizer from digestate product	0%
Other	1%

Almost 50% of the compost manufactured from source segregated waste in all of the UK is used in agriculture, mostly in arable and cereal crops farming. Horticulture accounts for about 13%, (amateur growing market 9% and the professional market 4%). Other major end markets include landscaping (about 10%), land regeneration (7%) and turf applications e.g. for racecourses and golf courses (about 2 per cent).

There is wide regional variation in markets used by composting facilities in the UK. Nearly 50% of the 100,000 tonnes of compost used in regeneration projects in 2005/06 were used in London.<sup>12</sup> Horticulture accounts for 30% or more of the end markets in Wales and the North West but very little in other areas. Compost used in agriculture ranges from less than 10% in Wales to almost 80% in Northern Ireland. This variation reflects not only the prevalence of agriculture within a region but also the availability of animal manure alternatives.

The report "Assessment and Evaluation of Outlets of Compost Produced from Municipal Waste" published by the EPA in 2002 estimated the potential annual sizes of outlets for MSW-derived compost shown in table 8.

**Table 7: Potential annual outlet estimates for BMW-derived compost (2002)**

Sector	Estimated potential outlets (t)	Rationale
Horticulture	55,000	<ul style="list-style-type: none"> <li>• 20% of existing horticultural peat and bark compost usage</li> <li>• No allowance made for usage on road verges</li> </ul>
Agriculture Conventional	250,000	<ul style="list-style-type: none"> <li>• MSW-derived compost best used on crop land</li> <li>• Based on an estimated 400,500 ha of crop land and assuming 12,500 ha (~3%) of crop land available annually and 20 t/ha (wet weight) MSW-derived compost applied as is</li> </ul>
Agriculture Organic	64,000	<ul style="list-style-type: none"> <li>• Presently 32,000 ha in production</li> <li>• Assumes 10% of land in organic production available annually and applied with 20 t/ha MSW-derived compost (as is)</li> </ul>
Contaminated land remediation	No estimate	<ul style="list-style-type: none"> <li>• Need to refine estimate of hectareage requiring remediation</li> <li>• Need to refine targets (i.e. timing) for land remediation</li> </ul>
Bogland restoration	20,000	<ul style="list-style-type: none"> <li>• At least 50,000 ha bogland requiring restoration</li> </ul>
Forestry	40,000	<ul style="list-style-type: none"> <li>• Assuming 10% of land in forestry production available annually and applied with 20 t/ha MSW-derived compost (as is)</li> </ul>
Export	18,750	<ul style="list-style-type: none"> <li>• Assuming 5% of annual 375,000 tpa horticultural peat exported</li> </ul>
<b>Total</b>	<b>447,750</b>	

<sup>12</sup> WRAP (2008) Market Situation Report, Realising the value of organic waste

Compost destination markets in Ireland were most recently reported for 2006 by the ECN and by Intertrade Ireland, shown in Table 9. Reasons for discrepancies in 2006 reporting are unclear, but may be related to numbers of facilities surveyed.

**Table 8: Reported markets for compost produced in Ireland - 2006<sup>13</sup>**

Compost uses	Product	2005	2006 (ECN)	2006 (ITI)
Agricultural land	Soil conditioner	55%	37,185 (37%)	26,328 (33%)
Landscaping			6,030 (6%)	12,765 (16%)
Horticulture			3,015 (3%)	11,170 (14%)
Other uses			-	3,989 (5%)
Peat dilution	Growing Media		16,080 (16%)	16,754 (21%)
Landfill cover <sup>14</sup>	Soil conditioner	45%	38,190 (38%)	8,776 (11%)
<b>Total</b>		<b>100%</b>	<b>100,500 (100%)</b>	<b>79,783 (100%)</b>

The agriculture, horticulture, landscaping, landfill cover and land reclamation markets account for 74% of the compost market. Growing media production, primarily listed as peat dilution above, accounts for 21% of production. Other uses account for 5% of the compost market.

Prices reported for bulk compost from the composting facilities, are in the €10-40 per m<sup>3</sup> range for compost ex-works bulk un-bagged, and increasing for bagged materials. The outlets reported for compost during the market survey suggest that some facilities place low value on compost produced.

The document "Assessment and evaluation of outlets of PBMW compost"<sup>15</sup> identified three classes of barrier to use of composts - heavy metals, pathogens, phytotoxic salts, phytotoxic organic acids and phytotoxic pesticides.

**Table 9: Irish prices reported for compost sold onsite**

Products on sale	Grade	€ per tonne, fresh	Per m3 fresh matter
Ex-works bulk un-bagged	General	€5 - 20	€10-40
Blends - 5 to 20 litres bags	Blends	€90	€180

Intertrade Ireland 2009 estimated the value of compost as a replacement for inorganic fertiliser to be approximately €30 per tonne. Further calculations of fertiliser value of compost presented in Appendix A.

The 28 composting facilities surveyed by EPA NWR 2010, composted 269,200 tonnes organic waste in 2009. If these facilities produced 40% compost by weight of input material, this suggests that 107,680 tonnes compost was produced by those facilities in that year.

### 3.1.2 About Irish compost product

Compost products sold in Ireland are typically categorised by product type and sometimes by recycled content. These products compete with organic horticultural products such as peat, manures, and soils. This categorisation is important to understand the market.

<sup>13</sup> 2005 data from EPA NWR factsheet; 2006 ECN data, ORBIT Final Report, "Compost production and use in the EU", 29 February 2008; 2006 ITI data from Intertrade Ireland report 2011, from 36 facilities surveyed, Island of Ireland data.;

<sup>14</sup> EPA National Waste Report (NWR) 2008 reports that 102,092 tonnes of woodchip & stabilised organics was used for recovery at landfill facilities. Tonnage of woodchip alone is not available.

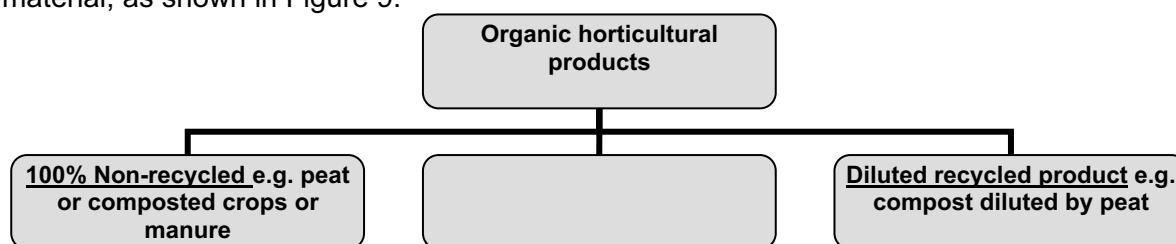
<sup>15</sup> EPA, 2002, Assessment and Evaluation of Outlets of Compost Produced from Municipal Waste Report

Products described in this document, according to categories as shown in table 11.

**Table 10: Organic products categorisation**

Product	Definition
<b>Soil conditioner</b>	A composted organic product, including vermicast, manure and mushroom compost suitable for adding to soils. This term also includes 'soil amendment', 'soil additive', 'soil improver' and similar terms. Soil conditioner typically has not >15% by mass of particles with a maximum size > 16 mm.
<b>Fine Mulch</b>	An organic product suitable for use on soil surfaces. Fine mulch has >20% but <70% by mass of its particles with a maximum size >16 mm.
<b>Mulch</b>	An organic product that is suitable for placing on soil surfaces. Mulch typically has at least 70% by mass of its particles with a maximum size >16 mm. Often 25- 40 mm grades are used as mulches.
<b>Growing media</b>	A growing medium suitable for the establishment and development of a wide range of plants in containers. This term also includes 'potting mix'.
<b>Soil blend</b>	General-purpose soil derived from blending two or more of: sand, natural soil material or organic materials and often having a bulk density > 0.7 kg/L and an organic matter content of between 3-15% by mass.
<b>Top dress</b>	A mix that is suitable for surface application to lawn.

Furthermore, organic horticultural products may contain 100% recycled, some or no recycled material, as shown in Figure 9.



**Figure 9: Classification of Organic Horticultural Products**

### 3.2 Methodology

Information for the market sounding was collected by using telephone interviews. Stakeholders were identified using trade organisation membership and government lists and companies own advertising through published literature, internet searches.

The survey of five sectors: retail, landscaping & forestry, horticulture, agriculture and organic farming, and the brownfield and contaminated land sector was conducted as a series of one-to-one interviews at appropriate industry events or telephone interviews.

Of the 54 organisations contacted, responses were received from 45 organisations. The number of respondents for each sector is as follows:

- In the agriculture sector, twelve contacts were made with traditional and organic farming sectors and with an organic farming representative organisation. .
- In the retail sector the seven companies contacted included two of the large multiples, one large Irish retailer and a number of smaller retailers operating in the Irish market.
- In the horticulture sector the eight contacts included fruit and vegetable commercial producers and the horticulture section of a Governmental organisation.
- In the landscape sector the eight contacts were active commercial landscapers.



- In the forestry sector the three contacts were active commercial forestry organisations.
- In the nursery sector the five contacts were active commercial nursery organisations.
- Two representative organisations with an interest in the compost use sector were contacted.
- The contaminated land sector was documented using presentations and onsite discussions about Galmoy and Lisheen mines during the CIWM conference and site visit on November 3<sup>rd</sup>, 2010 Thurles, Co. Tipperary "Mine Waste and Restoration of Mine Tailings".

An indicative list of questions is presented in Appendix B. The questionnaire for compost users was structured into four sections seeking: Contact details; Activities and products; Knowledge of sector; Products used volumes and types, prices paid, barriers.

Respondents completed those sections relevant to them via telephone interview. The questionnaire was largely quantitative, with most questions requiring either figures or responses to categorised answers (tick boxes). There were a few open ended questions, where clarification or opinions was sought and respondents may add general comments.

Many of those interviewed in all sectors were unable to provide precise quantitative data, such as prices paid for compost, volumes used, rates of application etc. Therefore, published data is used to supplement information, where available.

### 3.3 Agriculture and organic farming sector

#### 3.3.1 About the agriculture and organic farming sector

Of Ireland's land area, 64% (about 4.18 million hectares) is used for agriculture. Approximately 80% (3.36 million ha) of agricultural area is devoted to grass (silage, hay and pasture), 11% (0.46 million ha) is in rough grazing and the remainder circa 9% (0.38 million ha) is allocated to crop production.<sup>16</sup>

Fertiliser inputs to the agricultural industry cost approximately a third of a billion euro annually, spreading over 500 kilograms per hectare of arable land.<sup>17</sup>

The agricultural market is important due to its size and the security of outlets that it provides even though this market has paid low gate fees in Ireland. This sector is an intensive user of mineral fertilisers – some of which could be displaced by composts. The agricultural market requires sanitized and standardised quality compost, typically for use on cereal or combinable crops.

Applicants for the single payment scheme (SPS), the disadvantaged area scheme (DAS) and REPS 4 are obliged to comply with the provisions of “*Good Agricultural and Environmental Condition*”, one of which is the maintenance of organic matter levels in the soil. Where the soil organic matter level falls below 3.4%, on land which has been cultivated for more than six years, growers may be obliged to undertake remedial action. This represents a potential market for compost in tillage land, as compost is high in organic matter, albeit volumes will be restricted by nutrient content.

Food Harvest 2020 is an Irish Government report which sets the scene for the agri-food, drinks fisheries and forestry sector until 2020. It indicates that Ireland can grow its food and beverages annual export value by one-third to €12 billion, can increase farm and fishery primary production value by €1.5 billion and processing added value by €3 billion. The ending of milk quotas in 2015 represents an opportunity to grow milk output by 50%. This growth must be sustainable, and organic fertilisers can support sustainable growth.

The organic farming sector is a newly opened market that could use compost but was limited, until recently, to composts that were certified organic. A 2011 rule change by the UK Soil Association allows compost derived from household food waste to be used on organic farmland. A similar rule change is required in Ireland to allow this market to develop.

#### 3.3.2 Determining the actual usage of compost in this sector

The rx3 market survey of fourteen composting facilities in Ireland during November 2010 asked operators about the main markets and tonnages of compost sold from their facility. The aggregated response indicates the agricultural market consumed 29% of the fourteen respondent's tonnage.

The 28 composting facilities surveyed by EPA NWR 2010 composted 269,200 tonnes organic waste in 2009, producing an estimated 107,680 (40%) tonnes of compost. A 29% market share for the agricultural sector approximates to 31,227 tonnes of compost.

By comparison, the mean agricultural market share in Europe, in 2008 was 48%, with larger market shares in southern Europe. The share in the UK was 48% in 2007/2008, and 60% in

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<sup>16</sup> [www.teagasc.ie/agrifood](http://www.teagasc.ie/agrifood)

<sup>17</sup> [www.cso.ie/px/pxeirestat/Statire/SelectVarVal/Define.asp?maintable=ASEA2&PLanguage=0](http://www.cso.ie/px/pxeirestat/Statire/SelectVarVal/Define.asp?maintable=ASEA2&PLanguage=0) 1990-2003 data; [data.worldbank.org/indicator/AG.CON.FERT.ZS](http://data.worldbank.org/indicator/AG.CON.FERT.ZS)

2008/2009.<sup>18</sup> Intertrade Ireland (2011) and ECN<sup>19</sup> reported respectively that the agricultural market represented 33% and 37% of total Irish compost markets in 2006.

### 3.3.3 Level of awareness of compost and other recycled organics

There was a good level of understanding of compost and other organic fertilisers and soil amendments in the organic farming sector. Survey respondents understood the advantages of using organic material over a chemical fertiliser, but were equally aware of the requirement for assurances on the quality and certification of products produced before they could even be considered, whatever the claimed benefits.

Among the conventional farming sector, farmers with a ready supply of animal manure did not indicate a requirement to purchase compost as *'with the manure, everything is going well, don't see the need for compost'*, although farmers did note that they would be interested to accept compost free of charge. Farmers without a ready supply of animal manure expressed more interest in compost.

Farmers also queried how nitrogen and phosphorus from compost applications can be aligned with the requirements of the "Nitrates" legislation.

Respondents recognised the importance and supported the idea of creating an Irish supply of certified organic compost.

Some respondents were aware of local composting facilities offering compost for sale. One respondent indicated awareness of the industry compost quality standard and of the rx3 crop trials.

Some respondents commented that they would like to learn about trials with compost, and were informed of the ongoing rx3 crop trial.

### 3.3.4 Barriers to compost usage

The primary barriers identified during discussions with the agricultural sector include.

#### Quality

- Quality assurance schemes e.g. supermarket or brewery schemes or Bord Bia schemes for beef, grain, horticulture, dictate which materials may be used on assured produce. Crops that are consumed raw, e.g. salad vegetables, are sometimes considered by purchasers to be at risk of contamination from pathogens in compost and manures. Reference recent salad food scares in USA and Germany, where compost and digestate were investigated and eliminated, as a possible source of pathogens.
- The lack of a quality assurance scheme for compost affects composts penetration into the agricultural market.
- Respondents cited fears about "waste-derived" or "pathogen-bearing" compost. Farmers wanted to see and hear from Irish case studies of compost use, in order to learn how effective the material is, how to use it, and other characteristics of interest. E.g. transportation and application of compost differs in cost and technique from artificial NPK and the practicalities require consideration.
- The lack of Irish certified organic compost is a distinct barrier to penetration of compost into the Irish organic farming market and organic compost (meeting the European standard) is currently imported. The UK Soil Association announced a

<sup>18</sup> European data; Table 34 of "Compost production and use in the EU" ORBIT e.V. / ECN 2008: UK data; UK data, AFOR Survey of the UK organics recycling industry 2008/09.

<sup>19</sup> 2006 ECN data, ORBIT Final Report, "Compost production and use in the EU", 29 February 2008; 2006 ITI data from Intertrade Ireland report 2011, from 36 facilities surveyed, Island of Ireland data.;

change in April 2011 to the certification process that allows use of compost derived from food waste that is not certified organic. This change would require rules change in Ireland. This lack of organic certification addresses a key concern of the organic sector over presence of heavy metals, genetically modified organisms, and pesticides.

### Competition

- Manures and sludges (municipal and industrial), are supplied and spread to lands along with a nutrient management plan, and with associated soil testing free of charge or even with a gate fee. These materials may already have links to landholders (pig producers buy grain from and send manure to grain growers) or be familiar and trusted (Spent Mushroom Compost (SMC) and sludges). Peat is also widely available for producers seeking soil amendment. Compost requires a strong pitch to compete locally with these materials.

### Cost

- Cost of compost (relative to NPK compounds and manures) was a primary concern. Compost must be price competitive with NPK in order to be even considered. Farmers spoken with recognise the value of but might not be willing to pay for less tangible benefits like improved soil biota or carbon sequestration.
- Volatility of NPK prices restrains extensive use of compost, as farmers and contractors will not purchase compost spreading equipment based on potentially brief spikes in NPK prices. Sustained high prices for NPK would overcome this issue.

### Guidance and Implementation

- Normal crop production management requires certainty over additives applied as might be delivered by a compost quality standard and proposed compost quality assurance scheme. Clear guidance on contents, effects of application, nutrient release rates, application methods etc are needed. This certainty is perceived to be not yet available from composting producers.
- Agricultural advisers and contractors were cited as a key decision makers and facilitators respectively, and lack of information targeted at this sector is a barrier to its involvement.
- Farmers fear additional regulatory burden and potential for impact upon the Single farm Payment due to compost use e.g. through Animal By-products Regulation or Good Agricultural Practice requirements.
- A combined agricultural compost sales and spreading service is a business model that works well in other countries. Lack of an available spreading service along with compost sales may be a barrier to farmers from using compost.

#### 3.3.5 Quantification of compost use potential in conventional agriculture sector

For the purposes of this section, the agricultural sector is considered to comprise grass and cereal crop growers. Other growers are considered to be in horticulture sector.

Three primary agricultural sub-sectors for compost use are identified, conventional arable crop land, conventional agricultural grass land and organic farming land.

Conventional arable land can use over 15 tonnes of compost per hectare, depending upon soil quality, nutrient content and crop type. Assumption made that 4% of crop land is available annually.

Conventional grassland can use 15 tonnes compost per hectare. The rx3 trials applied 12.5 tonnes of compost per hectare. Assumption made that 0.1% of crop land is available annually. Trials supported by rx3 to examine the benefits of and potential from compost and

digestate use on spring barley and winter wheat and grass are ongoing during 2012. These trials help validate compost use figures.

The CSO reports hectareage of land in agricultural use. Making assumptions about how much of this land would use compost (based on the EPA 2002 study “Assessment and Evaluation of Outlets of Compost Produced From MSW”) and using compost application rates cited in the literature (compliant with Good Agricultural Practice (GAP) and demonstrated during rx3 crop trials), compost demand in the sector is estimated in Table 12.

**Table 11: Estimate of demand for compost in the agriculture sector**

Crop	Total land area 2009	% land available est.	Tonnes per hectare est.	Tonnes potential
<b>Total wheat</b>	83,000	4.00%	10	33,200
<b>Total oats</b>	20,100	4.00%	10	8,040
<b>Total barley</b>	185,900	4.00%	10	74,360
<b>Other cereals</b>	4,300	4.00%	10	1,720
<b>Pasture</b>	2,092,400	0.10%	10	20,924
<b>Hay</b>	220,300	0.10%	10	2,203
<b>Grass silage</b>	1,033,900	0.10%	10	10,339
<b>Arable silage</b>	25,400	0.50%	10	1,270
<b>Maize silage</b>	20,900	0.50%	10	1,045
<b>Total</b>	<b>3,686,200</b>	<b>17%</b>		<b>153,101</b>

These assumptions suggest that the conventional agricultural sector has potential to use over 153,000 tonnes of compost per annum, if compost were to be blanket spread on lands.

### 3.3.6 Quantification of compost use potential in organic agriculture sector

Organic production accounted for 52,821<sup>20</sup> hectares in Ireland in 2010. Assuming this land (crops and pasture) took 10 tonnes of compost per hectare and that 10% of crop land is available annually. Thus, the organic sector has potential to use 52,821 tonnes annually.

The horticultural sector of certified organic land is likely to be a more intensive user of compost that shown here.

Organic Farming Action Plan 2008 - 2012 targets conversion of 5% of land (215,000 hectares) to organic farmland by 2012. 10% of 215,000 hectares at 10t/ha has potential to use 215,000 tonnes compost per annum based on above estimates.

The organic farming sector represents a potential growth sector, given that certified organic composts are imported currently.

### 3.3.7 rx3 supported crop trials

Crop demonstration trials have been a feature of compost marketing in countries that have successfully introduced widespread source segregation, separate collection and composting of organic wastes. Information from these international trials is widely published. Similar projects are required in Ireland to demonstrate benefits of compost use to farmers.

<sup>20</sup> Department of Agriculture, Food and Fisheries  
[www.agriculture.gov.ie/publications/2011/annualreviewandoutlookforagriculturefisheriesandfood20102011/environment/organicfarming/](http://www.agriculture.gov.ie/publications/2011/annualreviewandoutlookforagriculturefisheriesandfood20102011/environment/organicfarming/)

Therefore, in 2010, rx3 appointed Methanogen Ltd to deliver a demonstration project showing market potential and to quantify technical, environmental, and financial aspects of the approach, to produce results aiding adoption of best practice on Irish commercial farms. The long term objective is to increase agricultural use of compost. The project trials occur during the 2010, 2011 and 2012 summer growth seasons.

Five farms, each growing either spring barley, winter wheat or grass silage, trialled and demonstrated use of quality compost and digestate against use of slurry and inorganic fertiliser in a commercial farming environment.



**Figure 10: Crop trials were conducted using commercial equipment**

The project is in its third season. Second year preliminary results, available April 2012, demonstrate a range of beneficial effects and practical learning's. These include:

- Separated digestate liquor and inorganic fertilisers showed similar nitrogen release rates.
- Soil organic matter (SOM) may increase over time, with use of organic fertilisers.
- Compost application timing is important to ensure adequate incorporation.
- Compost is well suited to grass/clover, with steady N-release; yields may increase.
- The high N availability in digestate appears to not diminish clover performance as does the N provided by inorganic fertiliser
- Organic fertilisers can be more financially attractive than inorganic fertilisers.

Importantly, the farmers are very satisfied with the results to date.



**Figure 11: Surveying crop trial plots in Tipperary**

The 2010 and 2011 trial seasons results, including a financial evaluation of the impact of using organic fertilisers, will be published after April 2012. The final report, including three seasons' results, will be published mid-2013.



**Figure 12: Pot-plant growth trials using grass**

A detailed chemical characterisation of the compost and digestate is being conducted. Incubation trials are studying nitrogen and phosphorus (N and P) availability of compost and digestate when mixed with soil. Pot-plant growth trials using grass are ongoing to determine relative availability of organic N and P relative to inorganic N and P. In all cases, a comparison of results will be made to another characterisation which is underway of 25 compost and digestate materials from another project and with results reported in international literature. These results are expected in May 2012.

An extensive information dissemination exercise has been conducted throughout the project, and over 400 interested parties have attended open days. A financial evaluation of effects is being developed. Importantly, the farmers are also very satisfied with the results to date.



**Figure 13: information dissemination is a key element of the rx3 programme**

Full 24-month results from the project are expected to be published during 2012.

### 3.4 Horticulture sector

#### 3.4.1 About the horticulture sector<sup>21</sup>

The total Irish household purchase in shops of horticultural products, including home produced and imported produce, is valued at €1.2 billion per annum.

The horticultural industry in Ireland produced output was valued at c. €366 million at farm gate values in 2010, of which the food and amenity sectors make up 80% and 20% respectively.

Irish food is primarily sold to the domestic retail market or the food service (i.e. catering) sector.

The key amenity horticultural crops include nursery stock production, protected flowers, ornamentals and Christmas trees. Amenity horticultural produce is primarily sold to the domestic retail market. This includes for example plant/flower sales (value €235 million per annum) through garden centres, DIY shops, lifestyle centres and supermarkets. The gardening & landscape market is an important element of the amenity horticulture sector.

The two main export products are mushrooms to the UK (value €100 million per annum) and amenity horticultural products (value €10 million per annum including nursery stock, cut foliage & Christmas trees).

Association for Organics Recycling (AfOR) reports that the primary horticultural crops using compost in the UK were; vegetables / fruit / salad crops, oilseed rape, beet, peas, potatoes, vegetables, orchard fruit, soft fruit, and glasshouse protected crops. All of these crops are widely grown in Ireland. The larger markets are described below;

**Potato sector** - In 2010, 11,200 hectares of potatoes were grown. Some 540 potato growers grew five hectares or more with approximately 200 of these growers accounting for more than 75% of total production. Potato production in 2010 was more than 450,000 tonnes. Production is primarily targeted at the domestic market.

**Field vegetables** - The total production area for field vegetables reported was 4,590 ha, with 212 commercial field vegetable growers.

**Protected crops** - The 120 protected crop growers, largely located in north Dublin, Louth and Wexford) grow mainly tomatoes, peppers, cucumbers and some flower crops. While areas and values of output overall have decreased over the years, there has been some significant investment by individual businesses in this sector in recent years.

**Fruit** - Over 70 growers produce soft fruit, mainly strawberries, raspberries and blackcurrants. The 196 hectares of strawberries comprise 50% of the total value of the protected edible crop sector output. Approximately 40 apple growers use 579 ha of production area. The top ten growers in terms of orchard size account for 64% of the total production area. Dublin, Tipperary, Waterford and Kilkenny are principal apple production counties.

**Amenity crops** - Hardy nursery stock production is the key segment of this sector making up 60% of its value. There are more than 100 nursery stock producers located mainly in Kildare, Tipperary, Kilkenny and the east of the country. Christmas tree output is valued at €9 million

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<sup>21</sup> [www.bordbia.ie/industryinfo/hort/pages/marketforhorticulturalproducts.aspx](http://www.bordbia.ie/industryinfo/hort/pages/marketforhorticulturalproducts.aspx) and [www.glasireland.ie/industry\\_info.aspx](http://www.glasireland.ie/industry_info.aspx) reporting on "Food Harvest 2020 - Report of the Horticulture Action Group" - June 2011



and foliage at €3 million euro. Due to the slow-down in economic activity and in particular in the landscaping market, many growers in the amenity nursery sector have re-aligned production systems to supply alternative markets (including the export market).

### 3.4.2 Determining the actual usage of compost in this sector

The rx3 market survey of fourteen composting facilities in Ireland during November 2010 asked operators about the main markets for compost sold from their facility. The aggregated response indicates that the horticultural market consumed 21% of respondent's product.

By comparison, the mean horticultural market share in Europe, in 2008 was 11.3%. The share in the UK (professional and amateur combined) was 14% and 13% in 2007/2008 and 2008/2009 respectively.<sup>22</sup>

Intertrade Ireland reported that the horticultural market represented 14% and use in peat dilution represented 21% of total Irish compost market in 2006.

ECN<sup>23</sup> reported that the horticultural market represented 3% and "blends" represented 16% of total Irish compost markets in 2006.

The 28 composting facilities surveyed by EPA NWR 2010 composted 269,200 tonnes organic waste in 2010, producing an estimated 107,680 (40%) tonnes of compost.

A 21% market share for the horticultural sector in 2010 approximates to 21,536 tonnes of compost.

The reported usage of horticulture sector interviewed during the market sounding varied from 40 m<sup>3</sup> per annum up to 1700m<sup>3</sup> per annum.

Horticulture operators report composting some of their own waste in small piles of chipped green wastes that compost down, relatively unmanaged, into product that they can re-use on sites. This use is not recorded centrally. Therefore the actual rate of use of compost in these sectors may be underreported.

### 3.4.3 Level of awareness of compost and other recycled organics

The level of awareness, technical knowledge and attitudes to compost in the sector was gauged during the market sounding exercise.

There was a good level of understanding of compost and other organic fertilisers and soil amendments in the horticulture sector. Respondents understood the advantages of using organic material over a chemical fertiliser.

Respondents were interested in talking to compost suppliers, even where they had not yet been using compost. One respondent, a strawberry grower, indicated willingness to trial compost products to evaluate benefits.

There was interest in finding out about other organic by products such as digestate and would like to see trials showing benefits to convince them to use compost.

The horticulture sector reported a demand for a variety of products from composting facilities including fine compost, coarse compost, potting mixes, mulch and bark products. Some

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<sup>22</sup> European data; Table 34 of "Compost production and use in the EU" ORBIT e.V. / ECN 2008: UK data; UK data, AFOR Survey of the UK organics recycling industry 2008/09.

<sup>23</sup> 2006 ECN data, ORBIT Final Report, "Compost production and use in the EU", 29 February 2008; 2006 ITI data from Intertrade Ireland report 2011, from 36 facilities surveyed, Island of Ireland data.;

respondents reported low demand e.g. large amounts of organic material are returned to soils growing brassica crops when crop residues in the field are ploughed back in.

Some respondents were aware of local composting operations offering compost for sale.

One grower reported producing own compost and reported interest in expanding this aspect of his business.

Overall, taking the reservations discussed into account, respondents were generally open to considering further compost use, depending upon further information on quality, quantity and costs being made available.

#### **3.4.4 Barriers to compost usage**

The primary barriers identified by the horticultural sector include;

##### **Quality and awareness**

- Quality assurance schemes e.g. supermarket or brewery schemes or Bord Bia schemes for beef, grain, horticulture. These schemes dictate which materials may be used on assured produce, and the lack of a quality assurance scheme affects the penetration of compost into the market. Crops that are consumed raw or where the harvested part of the crop is grown close to the soil are of concern. Recent disease outbreaks in USA and Europe with spinach and bean sprouts respectively, demonstrate the importance of having certainty over pathogen elimination.
- In addition to consumer driven quality concerns, the horticulture sector applies much importance on quality and consistency of cropping. Variable quality or low-quality inputs could be disastrous if crop failure resulted, with multiples of the value of the compost at stake.
- Respondents felt that quality assurance could not be delivered by composting facility operators, in the same way as peat producers could. Apart from obvious risks to crops, this could also jeopardise a horticulture growers' compliance with Bord Bia quality assurance scheme.
- Some compost products on the market have not been fit-for-purpose. One grower reported having trailed compost. However, it had high weed seed content and a high sodium content, so required dilution. The same grower noted awareness of the clopyralid issue in the USA and noted that a mistake over a large crop could be very costly to a grower.
- Respondent's reported that seedlings and young plants require properties (low electrical conductivity and nutrients) that compost products have not yet been demonstrated to possess.
- Benefits of compost application are seen over a number of years. Therefore, compost use is more likely where growers own or have a long tenure rather than short leases.
- Respondents in the horticultural sector reported high levels of awareness of compost and its marketing. This suggests that awareness of compost product and its properties is not a barrier in at least part of this sector.
- The Good Agricultural Practice for Protection of Waters Regulation's (the "Nitrates regulations") limits nutrient application rates by crop types, limiting applications of nutrient-rich compost to low rates.

##### **Competition**

- Manures and sludges (municipal and industrial), are locally available at low to no cost. These materials may be trusted (SMC and sludges). Peat is also widely available for producers seeking soil amendment. Compost requires a strong pitch to compete locally with these materials.
- Organic growers need access to certified organic compost, which is not yet available in Ireland.

### 3.4.5 Potential

Intensive horticulture in Ireland is frequently located on light soil types, e.g. in North Dublin. This soil type can benefit from compost application, so may be a possible market for compost. Intertrade Ireland<sup>24</sup> identified horticulture clusters in Ireland, in Table 13.

**Table 12: Horticulture Clusters on Island of Ireland**

Sector	Cluster	Sector	Cluster
Potatoes	Dublin / Meath / Louth Cork Wexford Donegal (seed)	Amenity	Kildare Tipperary Waterford / Kilkenny Cork / Kerry
Field vegetables	Dublin / Meath Cork Wexford	Protected crops	Dublin / Meath / Louth Cork Wexford
Apples	Armagh / Louth / Monaghan Tipperary / Waterford / Kilkenny	Fruit (not apples)	Dublin / Meath / Louth Cork Wexford
Mushrooms	Monaghan / Cavan / Armagh		

The distribution of these clusters matches the approximate distribution of composting facilities on the east and south coasts. This suggests that composting facilities close to horticulture clusters could target that horticulture cluster with specialised product development measures. Trials in these sectors by appropriate composting facility operators would help evaluate interest in the sector.

Growers of fruits indicated that compost may be useful as mulch, e.g. on strawberry crops. Other specialist horticulture sectors such as the turfgrass production sector are smaller users but, given high value of product, offer potentially high value for compost used.

The area in horticultural use in June 2009 reported by the CSO was 4,189,900 hectares total areas farmed and 402,100 hectares total crops, fruit and horticulture. Making assumptions about how much of this land would use compost (based on the EPA 2002 study "Assessment and Evaluation of Outlets of Compost Produced From MSW") and using compost application rates cited in the literature (and compliant with GAP), an estimate of compost demand in the sector is estimated, shown in Table 14.

**Table 13: Potential compost use in horticulture sector**

Crop/Sector	Total ha land area 2009	Est. % land available	Tonnes per ha est.	Tonnes potential
Potatoes	12,900	4%	20	10,320
Beans and peas	3,600	4%	10	1,440
Oilseed rape	6,500	4%	30	7,800
Turnips	1,500	4%	10	600
Total beet	8,300	4%	10	3,320
Vegetables for sale	4,200	10%	30	12,600
Fruit	1,600	10%	30	4,800
Nurseries, horticulture	1,500	10%	30	4,500
Other crops	19,800	10%	10	19,800
<b>Total</b>	<b>59,900</b>			<b>65,180</b>

These assumptions suggest that the horticultural sector has potential to use over 65,000 tonnes of compost per annum. However, growers renting land, e.g. as many potato growers do, may be focussed on short-term gains and be less inclined to improve soils than land owners, who may have longer-term goals.

<sup>24</sup> Intertrade Ireland, 2004, A Review of the All-Island Horticulture Industry

## 3.5 Retail sector

### 3.5.1 About the retail sector

Compost is sold in the retail sector through large multiple outlets and independent retailers, primarily DIY/hardware retailers and garden/specialist centres. Compost is sold bagged as a soil enhancer and as a growing medium, primarily to the amateur/hobby gardening sector.

This market requires advertisement and public relation measures. Smaller quantities (mostly bagged) create high packaging and distribution costs, but also higher returns.

The top two DIY multiples are owned by Grafton Group which operates Woodies DIY (33 outlets) and Atlantic DIY (8 outlets) and builder's merchants (62 outlets) for a combined turnover exceeding €500 million. Other multiples operators in the sector include B&Q and Wickes. A large number of independent retailers, large and small, sell compost. The number of independent outlets has not been quantified in this report.

Retailers sell to primarily amateur/hobby gardeners. The compost is sold as "multi-purpose compost" and specialist composts for plants and containers, "grow-bags" for growing vegetables and, to a lesser extent, soil improvers.

Irish retail prices for compost blends and some other materials published on Woodies website on 15 August 2011 were gathered and are presented in Appendix D. Retail prices range from €70 to €450/ m<sup>3</sup>. By comparison, also presented are UK prices published by Which Consumer magazine, 2010.

Intertrade Ireland 2011 reports that "*The retail market [in Northern Ireland] for composting products is highly differentiated into dozens of niche products (e.g. seed/ potting compost, container/basket compost etc), but bagged retail composts range in price from around £50 per tonne for multipurpose compost to over £1,000 per tonne for speciality blends (although the market for and yield of these products is small).*" The large pricing ranges observed may be partially explained by bag sizes as typically, larger bags provide cheaper compost per unit of weight.

Peat plays a large role in this sector, and issues around peat have been addressed in detail in this section of the report. The Irish retail sector has not yet agreed an approach to the peat use reduction issue as has happened in the UK with the Growing Media Initiative.

### 3.5.2 Determining the actual usage of compost in this sector

The rx3 market survey of fourteen composting facilities in Ireland during November 2010 asked operators about the main markets for compost sold from their facility. The aggregated response indicates that the amateur gardening market consumed 18% of respondent's product.

The retail markets for compost are not always reported separately and sometimes reported as part of the hobby/amateur gardening or the blending or peat dilution markets, and are considered together in for parts of this report.

Intertrade Ireland and ECN<sup>25</sup> reported respectively that the peat dilution and blends market represented 21% and 16% of total Irish compost markets in 2006.

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<sup>25</sup> 2006 ECN data, ORBIT Final Report, "Compost production and use in the EU", 29 February 2008; 2006 ITI data from Intertrade Ireland report 2011, from 36 facilities surveyed, Island of Ireland data.;

By comparison, the mean *amateur horticulture market* share in Europe, in 2008 was 11%. The share in the UK was 9% in both 2007/2008, and 2008/2009.<sup>26</sup>

The 28 composting facilities surveyed by EPA NWR 2010 composted 269,200 tonnes organic waste in 2010, producing an estimated 107,680 (40%) tonnes of compost. An 18% market share for the retail sector in 2010 approximates 19,382 tonnes of compost.

### 3.5.3 Level of awareness of compost and other recycled organics

Retailers reported a good degree of awareness of compost products, and associated alternatives, notably peat. However, retailers also reported customer's awareness as driving their decision making processes, and indicated that this awareness must be driven at a national scale.

The retail sector reports a demand from customers for a variety of products from composting facilities including fine compost, coarse compost, potting mixes, mulch and bark products.

### 3.5.4 Barriers to compost usage

The primary barriers identified by the retail sector identified include:

#### Quality

- Retailers expressed concerns about contaminants and items such as glass, sharps and stones in compost. Quality and consistency issues, purchasers require certainty over products applied. This certainty is perceived not to be available from composting facility operators.
- Retailers indicated that buyers using product for professional uses (primarily landscapers) previously found that recycled compost products have been of inferior quality despite being less expensive. This loss of confidence with the quality of recycled products may impact on their customer's willingness to try products in future.
- Retailers reported generally low awareness among their customers of the qualities and environmental benefits of compost or of the environmental impact of using peat. Retailers indicated that an awareness campaign is required in Ireland addressing awareness of the harmful effects of peat extraction, and the alternative solutions. Some respondents indicated that the environmental impact of using peat would affect the buying habits of the general public, but that awareness needed to be raised to facilitate this happening.
- The dominance of, customer familiarity with and physical characteristics of peat work to the detriment of compost products in the market, and some customers express a preference for high peat content products. Respondents noted that this contrasts with the UK market where there has been a shift to the peat reduction with an increase in the use of more sustainable products, led by the larger UK retailers.
- Some retailers indicated that they had previously stocked recycled compost products but that they have stopped stocking these due to lack of demand.
- Unclear and inconsistent labelling of content and properties of compost product was reported to be a barrier to its use.
- One retailer reported "*a preference among Irish retail buyers for multipurpose compost, as opposed to specialist mixes*". This preference would inhibit the final values available to compost producers, as specialist mixes garner higher prices.
- There are technical barriers to inclusion of high percentages of compost in growing media, such as the high nutrient (salt) content of compost which can cause seedling root damage.

<sup>26</sup> European data; Table 34 of "Compost production and use in the EU" ORBIT e.V. / ECN 2008: UK data; UK 2007/2008 and 2008/09 data, AFOR Surveys of the UK organics recycling industry.

- Growing media can be made and bagged up to six months before the peak spring sales period. The shelf-life of less stable composts products may be reduced due to biological activity.

### 3.5.5 Peat dilution, growing media and export horticulture markets

Peat has long been used as a horticultural ingredient and the horticultural industry relies heavily on peat sourced from bogs. However, peat bogs are increasingly recognised as valuable habitats for wildlife and important stores of carbon. Environmentalists, government and horticultural businesses now recognise the environmental consequences of using peat in horticulture, and the industry is turning increasingly to sustainable raw materials. This change is mandated in the UK, and as a significant supplier of peat to the UK market, Ireland is affected by these changes.

A proportion of the “compost” produced in Ireland for the growing media sector is diluted peat, so the peat dilution and growing media sectors require consideration. Much of this material is sold through the UK retail sector.

This is a technically demanding sector with complex supply chains blending and bagging peat and compost products in automated plant and selling through to retailers, and direct to end-users.

The island of Ireland is a major producer and exporter of peat-based growing media and soil improvers, producing 2.5 million m<sup>3</sup> annually. Bord Na Mona alone sold over 1.7 million m<sup>3</sup> horticultural peat products (value €49.2 million) in 2009/10. Peat producers exported 90% or 633,699 tonnes of peat from Ireland in 2010, much of it horticultural use in the UK (10,000 m<sup>3</sup> soil improvers and 1,612,000 m<sup>3</sup> growing media to the UK in 2007<sup>27</sup>), but also to the Benelux countries, France and Italy.<sup>28</sup>

Bord na Móna used over 100,000 m<sup>3</sup> of composted materials as peat diluents/replacements on the Kilberry site in 2009 for the UK retail market<sup>29</sup>.

Alternatives to peat, including recycled products made from compost and digestate, have been evaluated and incorporated into growing media in recent years and this market may represent a significant growth sector. Peat-free and peat-diluted growing media are used in significant volumes in professional and hobby markets in European countries, including France, Germany and Denmark, Italy, the UK and the Netherlands.<sup>30</sup>

There is increasing demand from UK markets for alternatives to peat due to UK government policy. The UK government introduced a target for 40% of growing media and soil improvers to be non-peat by 2005 in the Mineral Planning Guidance Note 13. The target was raised to 90% peat replacement by 2010 in the UK Biodiversity Action Plan in 1999. However, the UK industry missed the 90% peat reduction target by 2010 significantly. Further UK Government action is in consideration. The “Act on CO<sub>2</sub>” campaign is a plan to work with industry to achieve a complete phase out of peat from the amateur gardener market by 2020. The development of WRAP Guidelines for the Specification of Composted Green Materials Used as a Growing Medium Component (Growing Media Specification) influenced development in this sector.

The UK targets and demand from other European countries suggest that there is significant potential in Ireland to replace existing peat-based export growing media markets with peat-free and peat-diluted growing media and soil improvers. As a significant exporter of growing

<sup>27</sup> Monitoring of Peat and Alternative Products for Growing Media and Soil Improvers in the UK 2007; Compost and growing media manufacturing September 2007

<sup>28</sup> [www.ipcc.ie/2020peatextraction.html](http://www.ipcc.ie/2020peatextraction.html)

<sup>29</sup> Bord na Móna, 2010, Organic Waste to Horticultural Resource

<sup>30</sup> Peatlands International 1-2008

media and horticultural products to UK, the Irish peat dilution sector is actively working to comply with the Growing Media Initiative. Supply of suitable compost is a limiting factor and peat diluters have indicated willingness to source quality composted green waste from compost producers within the industry.

Bord na Móna used over 100,000 m<sup>3</sup> of composted materials as peat diluents/replacements on the Kilberry site in 2009 for the UK retail market.

New and innovative products continue to be launched, and technological improvements over the last decade are reflected in the excellent quality of many products now on the market. The consumer group “Which? Gardening” recognised this in awarding “Best Buy” awards to three peat-free container composts for the first time in March 2010, including Irish products.

### 3.5.6 Quantification of compost use potential in the retail sector

The volumes of compost sold for horticultural uses through the retail sector (including 100% compost, peat/compost blends and 100% peat) are not published, nor were they available from retailers. Comparisons with the UK market help to derive crude estimates;

The UK used 6.6 million m<sup>3</sup> of peat and alternatives used in growing products (soil improvers and growing media) in 2007. Of this, 69% is bought by amateur gardeners from retail outlets.<sup>31</sup> The proportion of peat diluents in these products overall was 54%, of which compost formed 30%, the balance being wood fibre coir etc.<sup>32</sup>

**Table 14: Calculation of potential compost use, in peat dilution sector**

	69% bought from retail	Dilution rate	Diluent was 30% compost	Compost / person in UK	Potential in Ireland
<b>Cubic meters</b>					<b>Tonnes / m<sup>3</sup></b>
6,600,000	4,554,000	2,459,160 (@54%)	737,748	0.012	53,123 m <sup>3</sup> = 26,561 tonnes

Thus, a crude, aspirational (due to lack of peat dilution targets) estimate of the potential retail sector market size in Republic of Ireland (population 4.4 million) is 26,561 tonnes of peat diluents/replacements at 54% dilution, as shown in Table 15.

Ireland is a major exporter of peat-based growing media and soil improvers, producing 2.5 million m<sup>3</sup> annually. Bord Na Mona sold 1.7 million m<sup>3</sup> horticultural peat products (value €49.2 million) in 2009/10, being 68% of the market. Peat producers exported 90% or 633,699 tonnes of peat from Ireland in 2010, much for horticultural use in the UK (10,000 m<sup>3</sup> soil improvers and 1,612,000 m<sup>3</sup> growing media to the UK in 2007)<sup>33,34</sup>.

Peat dilution with compost supports the market for retail blends exported to the UK. Bord na Móna, with 68% of the total peat export market, used over 100,000 m<sup>3</sup> of composted materials as peat diluents/replacements on the Kilberry site in 2009 for the UK retail market, suggesting that the 2009 UK peat dilution market was ~147,000 m<sup>3</sup>, (73,529 tonnes).

<sup>31</sup> DEFRA, 2010, Consultation on reducing the horticultural use of peat in England

<sup>32</sup> DEFRA, 2005, Monitoring of Peat and Alternative Products for Growing Media and Soil Improvers in the UK

<sup>33</sup> Monitoring of Peat and Alternative Products for Growing Media and Soil Improvers in the UK 2007; Compost and growing media manufacturing September 2007

<sup>34</sup> [www.ipcc.ie/2020peatextraction.html](http://www.ipcc.ie/2020peatextraction.html)

## 3.6 Landscaping & forestry sector

### 3.6.1 About the forestry sector

Ireland has 789,000 hectares (12%) of its land area used for forestry, about evenly split between public, primarily Coillte (397,804 ha) and private (347,651 ha) sector forestry. The species composition of the national estate is 25% broadleaf and 75% conifer species.<sup>35</sup>

The likely main uses of compost in forestry applications are at planting and nursery stages, as a soil improver, in growing media or as mulch or where rapid growth is required. Therefore, the forestry sectors where these actions occur are of most interest - nurseries and biomass growers.

In 1996, the Government published 'Growing for the Future', an ambitious strategy for the development of the forestry sector in Ireland to 2035. The strategic plan concluded that the national forest estate would need to increase to 1.2 million hectares (17% of total land area) by 2030. It aimed to achieve this by increasing forestation levels to 25,000 hectares per annum to year 2000 and 20,000 hectares per annum thereafter from 2001 to 2030. However, the rate of forestation has declined in recent years, just 8,314 hectares in 2010. Only 54% of the envisioned target (155,000 hectares) has been planted.

### 3.6.2 About the landscaping sector

The landscaping sector in Ireland is a service provider to landowners. The CSO reports that there are 2,312 active enterprises and 4,483 persons engaged in the sector.

The landscaping sector requires high quality product e.g. for potting soil mixes or growing media. The demand is for a range of special products and mixtures in the specialised applications. This requires product development work by the composting facilities. So packaged solutions are required, not only compost. Compost in this market is in strong competition with bark and peat based products and their well organised industries. However, prices paid are relatively high, and the market for these products is growing.

### 3.6.3 Determining the actual usage of compost in this sector

The rx3 market survey of fourteen composting facilities in Ireland during November 2010 asked operators about the main markets for compost sold from their facility. The aggregated response indicates that the landscaping market consumed 24% of respondent's product. The reported compost use by landscapers interviewed during the market sounding varied from 2 m<sup>3</sup> up to 4000 m<sup>3</sup> per annum.

No use of purchased MSW-derived compost was reported by the forestry sector, although use of spent mushroom compost and self-generated compost was reported. Landscapers and forestry operators reported some composting of own waste in small piles of chipped green wastes that compost down, relatively unmanaged, into product that they can re-use on sites. This use is not recorded centrally. Therefore the actual rate of use of compost in these sectors may be underreported.

The 28 composting facilities surveyed by EPA NWR 2010 composted 269,200 tonnes organic waste in 2010, producing an estimated 107,680 (40%) tonnes of compost. A 24% market share for the landscaping market approximates to 25,843 tonnes of compost.

WRAP, 2008<sup>36</sup> reports that the UK landscaping sector estimated that their use of compost in this market would grow by 5% per year. The 2007/08 total UK output of green waste compost

<sup>35</sup> [http://ec.europa.eu/ireland/press\\_office/media\\_centre/june2011\\_en.htm#23](http://ec.europa.eu/ireland/press_office/media_centre/june2011_en.htm#23)



into the landscaping industry is estimated at 354,000 tonnes or 5.7kg/person.<sup>37</sup> These estimates equate to 25,477 tonnes compost in Ireland. This suggests that Irish use of compost in the landscape sector approximates the UK rate.

By comparison, the mean landscaping market share in Europe, in 2008 was 12.4%. The share in the UK was 12% and 13% in 2007/2008 and 2008/2009 respectively.<sup>38</sup> Intertrade Ireland and ECN<sup>39</sup> reported respectively that the landscaping market represented 16% and 6% of total Irish compost markets in 2006.

The forestry sector was not described as an outlet that is in use in any of the Irish or European surveys conducted, including the rx3 survey. The UK reports that forestry accounted for <1% of compost use.

### 3.6.4 Level of awareness of compost and other recycled organics

The level of awareness of the sector was gauged during the market sounding exercise.

There was a good level of understanding of compost and other organic fertilisers and soil amendments in the landscaping and forestry sectors. Respondents understood the advantages of using organic material over a chemical fertiliser, but need reassurance on the quality of products produced. Landscapers reported use of a wide variety of organic products including multipurpose compost, peat moss, topsoil, ericaceous compost, bark, and manures, both compost and non-compost depending on availability and situation.

The forestry sector indicated use of agricultural manures in nurseries, with some spent mushroom compost and some self made green waste derived compost. No respondent indicated use of purchased compost.

### 3.6.5 Barriers to compost usage

The primary barriers identified by the landscaping sector identified include;

#### Quality

- One respondent noted that *'Cost, Quality and availability of product are the primary issues'*
- Respondents in both the landscaping and forestry sectors indicated some awareness of compost product and its marketing, e.g. by asking about weed seeds and heavy metal content of recycled compost. This suggests that awareness of the product and its properties is not a problem in all areas of this sector.
- Respondents reported a need for certified high quality products to use as a potting material, for soil improvement and mulches. Respondents felt that quality assurance had not been delivered by composting facility operators to date, in the same way as peat producers could. Variable quality or low-quality product could be disastrous if crop failure occurred, with multiples of the value of the compost at stake. The compost quality assurance scheme will address this deficit.
- Some respondents indicated they wished to grow in a sustainable manner and would be interested in all sustainable products; also indicated willingness to pay a premium for sustainable products but not at the expense of an inferior product quality.

<sup>36</sup> WRAP, 2008, Compost Market Assessment Report - Volume 2

<sup>37</sup> AFOR Survey of the UK organics recycling industry 2008/09.

<sup>38</sup> European data; Table 34 of "Compost production and use in the EU" ORBIT e.V. / ECN 2008: UK data; UK data, AFOR Survey of the UK organics recycling industry 2008/09.

<sup>39</sup> 2006 ECN data, ORBIT Final Report, "Compost production and use in the EU", 29 February 2008; 2006 ITI data from Intertrade Ireland report 2011, from 36 facilities surveyed, Island of Ireland data.;

- Landscapers surveyed felt that the visual impact of any mulch used was extremely important, and expressed concern about contamination content of composts.

### Business model/Logistics

- Landscapers reported a need for sites to drop green waste to and indicated that they would buy compost as they dropped material off if it were available. This service would facilitate their use of the material, but is not available.
- Respondents reported that self-made compost appears not to be a barrier to compost purchase due to the time required to weed seed and storage problems.
- One respondent noted that *“There is a lack of verifiable information on compost quality and technical advantages”*.
- One respondent noted that *“Recycled Grade Bark provided from Civic Amenity Centres in the past has had too many fines in it. This has put Landscapers off recycled products. Now even though the recycled products are less expensive there is a feeling that the products are inferior”*
- One respondent noted that the *“Main obstacles to the greater use of compost are odour and staining of fresh surfaces.”*
- One respondent noted that *‘I would consider a product if it was better than what I already use.... I would pay extra for a better product’*. This suggests that price is not a significant barrier in all aspects of the horticulture sector.
- Specification of compost within terms of landscape contracts is required if compost products are to be consistently used. If the specification is not explicit, then competing materials might be used, depending on costs. Applying green procurement guidelines will promote this objective. To open this market to regular compost use, product must be of consistent quality and available in sufficient quantity, often at short notice.

### 3.6.6 Quantification of compost use potential in the forestry sector

Ireland has 789,000 hectares (12%) of its land area used for forestry. The desired forestry plantation rate is 20,000 ha/year for the next 30+ years. If 1% of this 20,000 ha/year is available annually for compost application then approximately 200 ha/year will be available. Assuming an application rate of approximately 20 t/ha, this sector could potentially utilise 4,000 t of MSW-derived compost annually.

Forestry can use compost as a soil improver, as a growing medium or as mulch.

Composts could also be used within the biomass sector of the forestry industry. Trees grown for biomass must grow rapidly and would therefore benefit from the high levels of organic matter and nutrients present in composted MSW.

### 3.6.7 Quantification of compost use potential in the landscape sector

Compost application is often specified in depth in landscaping application where 1 mm depth = 10 tonnes/hectare. Thus, for example, reinstatement of shrub/herbaceous areas requires 2.5mm = 25 tonnes/hectare.<sup>40</sup>

The landscaping sector has a demand for a variety of products from composting facilities including fine compost, coarse compost, potting mixes, mulch and bark products. This makes it a useful revenue earner to combine with sectors that require large volumes of a single grade of material such as the agricultural sector.

WRAP<sup>41</sup> reports that the UK landscaping sector estimated that their use of compost in this market would grow by 5% per year. A 5% increase on the 25,843 estimate suggests potential use of 27,135 tonnes.

<sup>40</sup> WRAP (2003), Compost specification for the landscape industry.

<sup>41</sup> WRAP (2008), Compost market assessment report - volume 2

### 3.7 Brownfield and contaminated land sector

#### 3.7.1 About the brownfield and contaminated land sector

The brownfield and contaminated land sector has developed in recent years in Ireland, with much work conducted on mines restoration and landfill cover/capping. There are also a large number of smaller sites with activities likely to require land restoration in future. Bog restoration is a sector that requires consideration as peat extraction finishes and land requires restoration.

#### Contaminated land

EPA (2002)<sup>42</sup> estimated that there were 395-429 historic and 1580-1942 operational contaminated sites in Ireland. The number of historic and current industrial activities that may pose a risk to soil and groundwater are shown in table 16.

**Table 15: Industrial activities pose a risk to soil and groundwater**

Industrial Activities	Estimated Number of Activities	Status
Landfill sites - Closed (EPA Licensed) (2009)	68	Closed
Landfill sites - On-site, open (2009 data)	48	Current
Existing Landfill sites, un- or partially lined	0	Current
Old Gasworks Sites	50-80	Closed
Non-Hazardous and Hazardous Waste Disposal Sites Closed Subject to S.I. 524 of 2008, (2009 data)	327	Closed
Closed Mining Sites (38 with tailing ponds)	128	Closed
Old Fertiliser Plants (Manufacturing and Blending)	4-6	Closed
Closed Tanneries	10-12	Closed
Mining sites in operation	4	Current
Chemical Industry	150-160	Current
Petroleum Import Terminals, (Not including on-site industrial storage facilities)	22	Current
Petrol Station underground storage (30-35% constructed before 1979 Regulations.)	900-1200	Current
Tanneries	3	Current
Timber Treatment Yards	150	Current
Dockyards	14-16	Current
Military Sites	1	Current
Railway Depots	80-100	Current
Scrap Yards and Dismantlers	180-200	Current
Airports with Maintenance Facilities	2	Current

**Mine tailings** - Ireland has a number of mining sites that have large tailings ponds where mining waste is stored, pending rehabilitation. Tailings ponds facilities in Ireland include Lisheen (78 hectares), Tara (170 hectares), Galmoy (33.5 hectares), and Aughinish Alumina Red Mud Pond (35 hectares).

**Landfills** - Landfills use significant amounts of soil-like materials as daily cover, intermediate cover, temporary capping and final capping. Final capping, restoring land to a final function, offers potential for compost use as a soil additive to enhance soil properties which benefit plant growth in the top soil layer.

<sup>42</sup> EPA, 2002, Assessment & Evaluation of Outlets of Compost Produced from Municipal Waste Report

**Bogland** - Ireland has large areas of cutaway bogland that has been drained and stripped of peat. This land requires appropriate restoration and is mandated by IPPC licence, in some instances. The end-use selected may require soil amendment or soil manufacture, and thus could prove a potential market for compost in certain instances.

### 3.7.2 Determining actual usage of compost in the brownfield sector

Landfill operators must demonstrate that all waste delivered to the landfill has been adequately pre-treated. Biodegradable waste must be stabilised to achieve the reduction of the decomposition properties so that offensive odours are minimised and that the stability standard specified by the waste licence is achieved. Thus, mixed MSW may be processed into compost like output, termed stabilised biowaste. This stabilised biowaste, while still a waste, may have use as cover material on landfills. Compost product is used on landfill as final cover material or as a capping material on mine tailings ponds.

The rx3 market survey of fourteen composting facilities in Ireland during November 2010 asked operators about the main markets for compost sold from their facility. The aggregated response indicates that the landfill cover market consumed 7% of respondent's product.

By comparison, the mean land restoration and landfill cover market share in Europe, in 2008 was 26.4%. The combined (land restoration + landfill cover) share in the UK was (14%+6%) = 20% in 2007/2008 and (3%+6%) = 9% in 2008/2009.<sup>43</sup> The fluctuation in the land restoration market may be due to the large project based nature of the demand.

Intertrade Ireland and ECN<sup>44</sup> reported respectively that the land restoration and landfill cover market represented 11% and 38% of total Irish compost markets in 2006.

The 28 composting facilities surveyed by EPA NWR 2010 composted 269,200 tonnes organic waste in 2010, producing an estimated 107,680 (40%) tonnes of compost. A 7% land market share for the restoration and landfill cover sector approximates to 7,537 tonnes of compost.

### 3.7.3 Level of awareness of compost and other recycled organics

Irish mining companies have investigated the use of soil forming/soil improving materials to grow vegetation on tailings ponds. These materials are needed because it is difficult to grow grass on bare tailings due to nutrients deficiencies and the lack of organic matter. In order to encourage growth, environmental stability must be achieved. This is done by the addition of organic material, including composts, which can support good and stable vegetative growth. This use of soil forming/soil improving materials presents a possible opportunity to the composting sector.

Galmoy and Lisheen mines have used manufactured soils on tailing ponds.

Galmoy mine has tailings cells with a combined surface area of 33 hectares. Phase 1 (9 hectares) was rehabilitated starting 2007 using a manufactured soil. The facility reports having used 127,000 tonnes of organic substrate (65,000 tonnes brewer's grains, 2,600 tonnes limed sewage cake, 60,000 tonnes compost) mixed with 120,000 tonnes glacial till. The rehabilitated section now supports good vegetative cover of grasses with white clover that can be used as animal feed. Following closure of Galmoy mine, the remaining area of tailings cells will be rehabilitated. Use of organic substrate at the same rates as Phase 1 on 24 hectares would entail use of significant use of organic substrates.

<sup>43</sup> European data; Table 34 of "Compost production and use in the EU" ORBIT e.V. / ECN 2008: UK data; UK data, AFOR Survey of the UK organics recycling industry 2008/09.

<sup>44</sup> 2006 ECN data, ORBIT Final Report, "Compost production and use in the EU", 29 February 2008; 2006 ITI data from Intertrade Ireland report 2011, from 36 facilities surveyed, Island of Ireland data.;

Lisheen mine (scheduled for closure in 2013) has 78 hectares under tailings. Part of this area has been restored using a growth medium manufactured using a blend of peat and glacial till at 400mm depth (4,000 m<sup>3</sup>/ha) to form growth medium for plants. The land has been returned to pasture grazing uses on a trial basis. Significant further areas of tailings must yet be restored. Use of organic substrate on the large areas involved would entail use of significant use of organic substrates.

### 3.7.4 Barriers to compost usage in the brownfield sector

The primary barriers identified by the land restoration and landfill cover sector include;

- Specification of the product by designers is required if compost products are to be consistently used. If the specification is not explicit, then competing materials might be used, depending on costs. To open this market to regular compost use, product must be consistent quality and available in sufficient quantity, often at short notice. The supply chain to remediation sites may involve organisations such as engineers and soil blenders.
- Ability to deliver very large volumes of product in a very short period of time will require appropriate compost storage measures, at producer or user premises.

### 3.7.5 Quantification of compost use potential in the brownfield sector

#### Landfills

Minimum requirements for final capping of landfills for non-hazardous waste including > 1m top layer of soil as a cover. WRAP<sup>45</sup> cites use of compost applied with topsoil for soil improvement in quarry restoration at rates of over 300 tonnes per hectare.

EPA data<sup>46</sup> indicates that there were 82 hectares temporary capped and 24 hectares uncapped, or 106 hectares total at MSW landfills open in 2008. Closure of 106 hectares (just over 1 million m<sup>2</sup>) will require 1 million m<sup>3</sup> of soils at 1m depth. These soils typically include 150mm to 300mm topsoil depending on proposed final use.

Compost could form a significant proportion (20-40%) of the topsoil depending upon soil conditions and quality, plant tolerances, and manufacturer's recommendations. Thus, use can be estimated at 10%, or 100,000m<sup>3</sup> (50,000 tonnes total). This volume would be used over the estimated 5 years that the final capping is put in place. This equates to 10,000 tonnes per annum.

#### Bogland

EPA, 2002<sup>47</sup> assumed that if 50,000 ha of bogland were restored over 10 years, and that 20% was available annually for compost application, at a rate of 20 tonnes/ha, then this sector could utilise 20,000 t of MSW-derived compost annually. The assumption spent bogland that would not have sufficient peat onsite to manufacture soil requires verification.

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<sup>45</sup> WRAP, 2010, Good practice guide to use of PAS 100 compost in landscape & regeneration, table 3.

<sup>46</sup> Environmental Protection Agency 2010 Focus on Landfilling in Ireland

<sup>47</sup> EPA, 2002, Assessment and Evaluation of Outlets of Compost Produced from Municipal Waste Report

## Mine tailings and other brownfield

Compost application in brownfield application is often at very high rates. WRAP estimates the compost potential of a series of uses associated with regeneration and remediation of brownfield sites as shown in Table 17.<sup>48 49</sup>

**Table 16: Compost use potential for regeneration and remediation of brownfield sites**

Use	End use Opportunities	Green area	Application rate	Compost use
<b>Woodland</b>	In situ soil improvement / mulch	100%	250 t/ha	250 t/ha
<b>Golf course</b>	Top dressing / landscaping	100%	125 t/ha	125 t/ha
<b>Parks/POS</b>	In situ soil improvement / landscaping	100%	250 t/ha	250 t/ha
<b>Mixed Development</b>	Topsoil manufacture / in situ soil improvement / landscaping	20%	250 t/ha	50 t/ha
<b>Urban housing</b>	Landscaping	25%	250 t/ha	62.5 t/ha
<b>Rural housing</b>	Landscaping	40%	250 t/ha	100 t/ha
<b>Urban shop/sports complex</b>	Landscaping	55	250 t/ha	12.5 t/ha
<b>Large colliery regeneration</b>	topsoil manufacture / In situ soil improvement / landscaping / bioremediation	100%	500 t/ha	500 t/ha
<b>Habitat establishment / amenity land</b>	Soil formation	100%	50 -100 t/ha	50 -100 t/ha

While an estimate of compost use per unit of land is given, the area of contaminated land must be determined before an estimate of the magnitude of this potential outlet can be assessed.

Nevertheless, with numbers of contaminated land sites numbering in thousands, and with high rates of use per hectare, this sector poses a large potential market.

<sup>48</sup> WRAP, 2006, Uses of compost in regeneration and remediation of brownfield sites in the UK

<sup>49</sup> SNIFFER (2010), Code of Practice for the use of sludge, compost and other organic materials for land reclamation.

### 3.8 Summary of market potential for compost

Current use of compost accounts for 189,287 tonnes and the market potential identified is 479,092 tonnes. Much of the potential value in the sector

ECN mean European market prices suggest that current compost production is worth (but not necessarily achieving) over €14 million with a potential market valued at over €22 million. This market value estimate is heavily weighted by the centralised “export for peat dilution” sector, which accounts for a significant proportion of the calculated value. Data on potential compost markets is summarised in Table 18.

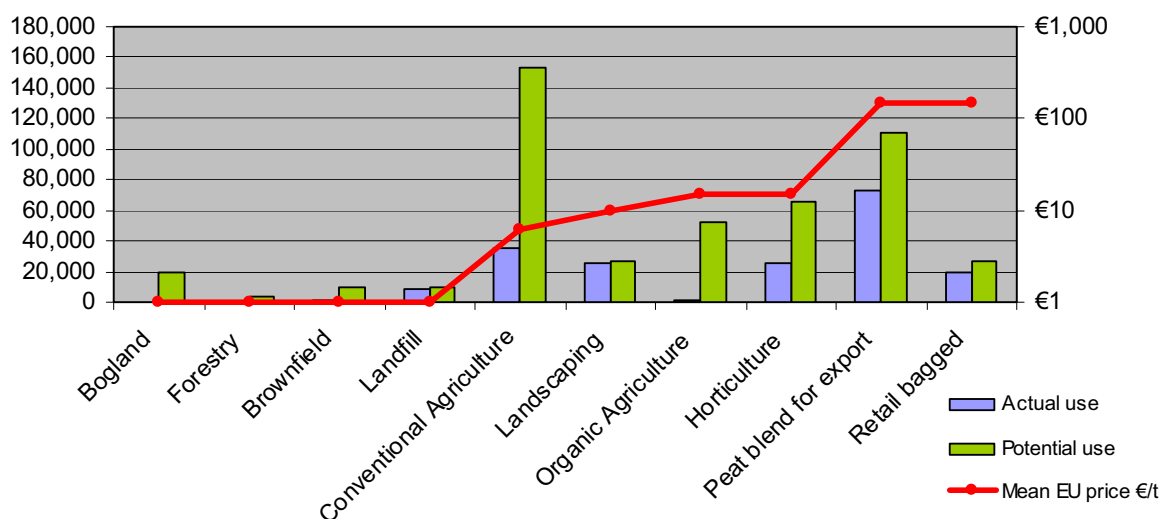
**Table 17: Actual and potential compost market sizes, issues and estimated unit values**

Outlet details	Actual use	Potential use	Mean EU price €/t	Current value at mean EU price	Potential value at mean EU price
<b>Bogland</b>	0	20,000	€1	€0	€20,000
<b>Forestry</b>	0	4,000	€1	€0	€4,000
<b>Brownfield</b>	1,000	10,000	€1	€1,000	€10,000
<b>Landfill</b>	8,540	10,000	€1	€8,540	€10,000
<b>Conventional Agriculture</b>	35,008	153,101	€6	€213,549	€933,916
<b>Landscaping</b>	25,477	27,135	€10	€254,770	€271,350
<b>Organic Agriculture</b>	1,000	52,821	€15	€15,000	€792,315
<b>Horticulture</b>	25,351	65,180	€15	€380,265	€977,700
<b>Peat blend (export)</b>	73,529	110,294	€145*	€10,661,705	€15,992,558
<b>Retail bagged</b>	19,382	26,561	€145*	€2,810,390	€3,851,345
<b>Totals</b>	<b>189,287</b>	<b>479,092</b>		<b>€14,345,219</b>	<b>€22,863,184</b>

\* High prices because sold in small bags (5 to 20 litres) - See Appendix D for Irish prices

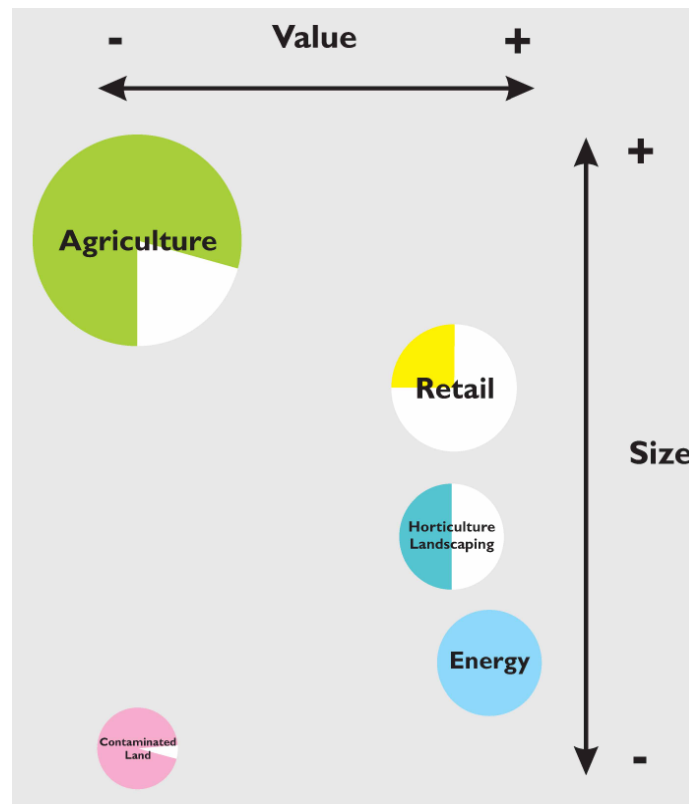
There are a number of different sectors, with quality requirements being a common demand by the higher value markets.

Figure 14 maps the actual and potential market sizes and uses in bar charts against left scale, against ECN unit value estimates as line chart, right axis in log scale.



**Figure 14: Actual & potential compost market size, tonnes, V mean EU price (log scale), €/t**

Figure 15 presents the value and volume data graphically, also adding an indication of where bioenergy use would likely lay.



**Figure 15: Graphical depiction of market size, and values**

The price paid for compost doesn't reflect the real value and the production costs, contrary to many other products. In the compost industry, most revenue is earned at the gate (gate fee) or at the weigh bridge (tonnes of waste accepted). Few Irish companies, with notable exceptions, have developed their local market so well that compost sales contribute significantly to the companies' economical success. So in most cases additional effort and competence in market and product development and marketing will be required to enter into the revenue oriented high price markets.

The trends in compost prices are unclear. Some data sources suggest that prices are rising, while others suggest falling prices. On one hand, supply of compost from source segregated wastes has increased significantly in recent years, possibly putting downward pressure on prices. On the other, demand for composts is also growing. It is not clear which of these effects is dominating.

This report suggests that potential for sales of compost products exists in;

- Horticultural clusters show that local markets potentially exist for composting facilities.
- Irish certified organic compost which could displace German/UK imports.
- rx3 crop trials show that compost can displace artificial fertiliser for lower costs. Improved arable and grass crop yields were also shown.
- Quality focussed markets that require quality assurance can be addressed using the national compost quality assurance scheme 441.
- Lack of high quality compost product for specialist users, e.g. in sports turf sector.
- Specialist compost brokers/sales companies that can undertake logistics of compost sales from specialised compost producers not wishing to diversify into this area.
- Higher value peat dilution and retail sales outlets.



## **APPENDIX A**

## Appendix A - Sample Calculation of Financial Value of Compost

Compost and digestate contain the key nutrients N, P and K, which have a direct financial value compared with inorganic fertilisers. The prices of chemical-based fertilisers increased to historically high levels in 2007/2008 and have only slightly moderated since then. This increase has been driven both by the increase in the prices of natural gas/oil and strong world demand for fertilisers. Thus, use of compost as an alternative source of nitrogen and phosphorus has the potential to offer cost savings to farmers. The value accruing from fertiliser content of compost can be calculated using selected artificial NPK market prices based on the typical total nutrient contents of composts and digestate.

**Table A-1: Calculation of fertiliser value of composts<sup>50</sup>**

	<b>Nitrogen (N)</b>	<b>Phosphorus (P<sub>2</sub>O<sub>5</sub>)</b>	<b>Potash (K<sub>2</sub>O)</b>	<b>Total</b>
	<b>€0.75/Kg</b>	<b>€0.84/Kg</b>	<b>€0.57/Kg</b>	<b>-</b>
<b>Green waste compost</b>				
Fertiliser equivalent (kg/tonne compost)	7.5	3	5.5	-
Financial value of nutrients in compost (€/tonne compost)	€5.63	€2.52	€3.17	<b>€11.32</b>
<b>Green/Food waste compost</b>				
Fertiliser equivalent (kg/tonne compost)	11	3.8	8	-
Financial value of nutrients in compost (€/tonne compost)	€8.24	€3.19	€4.61	<b>€16.04</b>
<b>Digestate</b>				
Fertiliser equivalent (kg/tonne digestate)	6.92	0.85	1.95	-
Financial value of nutrients in digestate (€/tonne digestate)	€5.19	€0.71	€1.12	<b>€7.02</b>

Thus, one tonne of typical green/food waste compost was worth €16.04 in fertiliser at the selected artificial NPK prices. Additional parameters such as disease resistance or improved soil health would add extra value, not quantified here.

This calculation may be converted into actual savings using calculations and assumptions for the individual case involved.

The proportion of each nutrient that is immediately available for crop uptake will differ between materials and will vary from facility to facility - for example, around 90% of the nitrogen in digestate and 10% in green/food compost may be immediately available to crops. The market price of fertilisers will also vary over time. Therefore, calculations should be made on a case by case basis. However, calculated values would be a useful marketing tool to demonstrate direct financial value. This value is offset by the costs compost purchase, transport and spreading, (~ €1.15-€3.5 per tonne).

Further to the fertiliser value, other properties such as organic matter content can offer improvements to soil quality in the medium and long term - providing further financial value. A high proportion of this is lignified (stabilised), unlike other organic materials. Benefits include improved soil tilth, effects on diseases and increased macro-organism presence.

<sup>50</sup> Wrap Compost Calculator, using currency exchange: 1 pound sterling = 1.15 Euros  
[www.wrap.org.uk/farming\\_growing\\_and\\_landscaping/compost\\_calculator.html](http://www.wrap.org.uk/farming_growing_and_landscaping/compost_calculator.html)

## **APPENDIX B**

## Appendix B - QUESTIONNAIRES

Table B-1: Typical list of questions asked of composting users

Section A :	Contact Details
Contact name, job title	
Organisation name and address	
Telephone and email address	
Section B: Activities and products. Does your company or facility use compost site?	
<b>If Yes</b>	
<ul style="list-style-type: none"> <li>What types &amp; how much? Where is the compost sourced?</li> </ul>	
<b>If No</b>	
<ul style="list-style-type: none"> <li>Do you use other organic amendments such as peat, mulch, bark, peat/compost mixes, shredded wood, manures, sludges, shredded green waste etc?</li> <li>What proportion of this could they replace with compost? What do they pay for the organic amendments? In which sectors of their business is there potential for compost use</li> </ul>	
<ul style="list-style-type: none"> <li>How much compost could your company / facility use at upper range? ie displacing all artificial nutrients, if possible.</li> <li>What are the main obstacles to the greater use of compost in the sector?</li> <li>Do you see a value in compost?</li> <li>Are you aware of the rx3 project using compost on arable crops?</li> </ul>	
Section C: Knowledge of Sector	
<ul style="list-style-type: none"> <li>Are you aware of rx3 and the work that it does?</li> </ul>	
Section D :	Organic Amendment Horticulture Activity

**Which of these products do you use? And List prices paid per m<sup>3</sup> or other units?**

- |  |  |  |
|--|--|--|
| <ul style="list-style-type: none"> <li>Multi-purpose compost</li> <li>Peat moss</li> <li>Alternative amendments</li> <li>Top soil</li> </ul> | <ul style="list-style-type: none"> <li>Peat free compost</li> <li>Bark</li> <li>Cocoa shell</li> <li>Manure, Composted</li> <li>Manure, non-composted</li> </ul> | <ul style="list-style-type: none"> <li>Ericaceous compost</li> <li>SMC</li> <li>Other (specify)</li> </ul> |
|--|--|--|

**Where do you source these products? Please specify which product from which source?**

**Specify source by name (if willing to do so)?**

- |  |   |
|--|---|
| <ul style="list-style-type: none"> <li>Self generated</li> <li>Domestic retailer (Woodies etc)</li> <li>Composting facility</li> <li>Farmer (manures)</li> <li>Civic Recycling Facility (e.g. drop off and pick up)</li> <li>Forestry sector (e.g. bark, shredded wood, mulch, etc)</li> </ul> | <ul style="list-style-type: none"> <li>Construction sources</li> <li>Peat producing / blending facility</li> <li>Other (specify)</li> </ul> |
|--|---|

**What barriers are there to the development of markets for compost from waste materials? Responses *might* include some or all of the following;**

- |   |  |
|---|--|
| <ul style="list-style-type: none"> <li>Lack of awareness of compost qualities and environmental benefits among customers</li> <li>Preference for _____ product</li> <li>Unclear labelling on packaging</li> <li>Cost</li> </ul> | <ul style="list-style-type: none"> <li>Other, please describe</li> </ul> |
|---|--|

**Quantities of compost that could be used in this sector**

We wish to estimate quantities of compost that could be used in your sector if barriers are overcome. Do you think that your use of organic amendments, compared to the rest of your sector is?

High                                      Typical                                      Low                                      Other, please describe

**Table B-2: Typical list of questions asked of compost producers**

<b>Section a: organisation details</b>		
<b>A1 Organisation name and address</b>		
Name, job title		
Organisation name and address		
Telephone, email address		
<b>A2 - What is the primary role of your organisation?</b>		
<ul style="list-style-type: none"> <li>○ Commercial compost producer</li> <li>○ Equipment / plant supplier / hire company</li> <li>○ Waste management company / landfill operator</li> <li>○ Agricultural</li> <li>○ Horticultural</li> <li>○ Community group / not for profit</li> <li>○ Other (<i>please specify</i>) .....</li> </ul>		
How many composting sites operated?		
<b>Section B: Composting site details</b>		
<b>B1 - Composting site operator and site name and address</b>		
Name of organisation operating composting site.....		
Composting site name and address.....		
<b>B2 - Feedstock source and compost use</b>		
Is your composting feedstock: produced on-site or brought in from external source or both		
Is your compost product: used on-site or distributed off site or both		
<b>Composting site operations quantity and type of organic material</b>		
<ul style="list-style-type: none"> <li>• Throughput - total quantity of source segregated wastes composted or digested in 2009/10 (excluding MBT and mixed wastes composting)..... Tonnes</li> <li>• Please list all those applicable, and specify the quantity composted in 2009/10                             <ul style="list-style-type: none"> <li>A) tonnes municipal household waste (<i>i.e. Household waste collected by local authority or on their behalf</i>)</li> <li>B) municipal non-household waste (<i>i.e. Non-household waste collected by local authority or on their behalf</i>)</li> <li>C) non-municipal waste</li> </ul> </li> </ul>		
<b>Section C: Compost product</b>		
I. Which, and how much, of the following did you produce in 2009/10? (please tick all applicable and give the quantity in tonnes/ m <sup>3</sup> /litres and % sold/free/used onsite)		
<ul style="list-style-type: none"> <li>• Mulch (surface applied large particles to suppress weeds, retain moisture, prevent erosion)</li> <li>• Soil conditioner (incorporated into soil to improve, structure, nutrient and biological properties)</li> <li>• Growing media constituent (not soils, used alone or in specific mixtures for plants)</li> <li>• Turf (top) dressing (fine composts to improve establishment and growth of turf)</li> <li>• Ingredient in manufactured soil</li> <li>• Other type of product (please specify, e.g. Landfill cover, biofuel, organic fertiliser)</li> </ul>		
<b>Section D: markets, outlets and end-uses</b>		
I. Detail the total quantity manufactured for each outlet in 2009/10. State the principal product type		
Market sector	Quantity manufactured tonnes / m <sup>3</sup> / litres	Principal product (estimate %)
Horticulture ( <i>professional growers using intensive systems, e.g. flowers, nursery stock, fruit &amp; veg</i> )		
Amateur gardening ( <i>e.g. retail outlets/civic amenity</i> )		
Agriculture ( <i>e.g. Arable farmers, livestock farmers</i> )		
Landscaping		
Grounds maintenance ( <i>e.g. grounds, roads</i> )		
Sports pitches		
Land restoration ( <i>e.g. Brown field, mining areas</i> )		
Landfill restoration		
Landfill - daily cover		
Other e.g. Efw, forestry, bioremediation ( <i>specify</i> )		

## **APPENDIX C**

## Appendix C - Percentage Outlets Share of European Compost Market

Table C-1: Compost market shares by sector in European composting countries (%)<sup>51</sup>

EU Market shares 2003-2006	AT	BE/FI	DE	ES *	FI	FR **	HU	IT	NL bw	NL * gw	UK	IE	Mean EU%
Sector	2003	2005	2005	2006	2005	2005	2005	2003	2005	2005	2005	2006	
<b>Agriculture</b>	40	1	53.4	88	20	71	55	51	74.8	44.4	30	<b>37</b>	48
<b>Horticulture &amp; green house production</b>	10	1	3.9	8	-	25	15	-	-	15.5	13	<b>3</b>	11.3
<b>Landscaping</b>	15	22	15.9	4	20	-	10	6	3.6	12.3	14	<b>6</b>	12.4
<b>Blends</b>	15	6	13.6	-	10	-	-	-	15	5.1	2	<b>16</b>	10.3
<b>Soil mixing companies</b>	2	21	-	-	-	-	-	-	-	9.4	-	-	10.6
<b>Wholesalers</b>	-	9	-	-	-	-	-	-	-	5.2	-	-	9.7
<b>Hobby gardening</b>	15	20	11.9	-	-	4	5	27	1.1	2.3	25	-	11
<b>Land restoration and landfill cover</b>	2	1	-	-	50	-	15	2	-	-	16	<b>38</b>	26.4
<b>Export</b>	1	7	-	-	-	-	-	-	5.5	5	-	-	4.6
<b>Others</b>	-	2	1.3	-	-	-	-	-	-	0.8	-	-	1.4

\* Green waste compost

\*\* Mainly mixed waste compost

<sup>51</sup> European Commission Final Report, 2008, "Compost production and use in the EU"

## **APPENDIX D**



## Appendix D - Retail Compost Prices

Prices on [www.buy4now.ie/woodiesdiy](http://www.buy4now.ie/woodiesdiy) 15.8.2011

**Table D-1: Retail Compost Prices**

Product	Description	€/ m <sup>3</sup>	€/t*
Erin 100 Litre Excel Multipurpose Compost	Compost blend	70	140
Erin Decorative Mini Chip Bark 75 Litre	Bark	100	200
Erin Ericaceous Compost 50 Litre	Compost blend	90	180
Erin Excel Multipurpose Compost 25 Litre	Compost blend	120	240
Erin Excel Multipurpose Compost 50 Litre	Compost blend	90	180
Erin Excel Tomato Planter	Unclear	60	120
Erin Excel Vegetable Planter	Unclear	60	120
Erin Irish Moss Peat 100 Litre	Peat	70	140
Erin Irish Moss Peat 175 Litre	Peat	50	100
Erin Multi-Purpose Compost 50 Litre	Compost blend	70	140
Erin Tree, Shrub & Rose Compost 50 Litre	Compost blend	90	180
Growise Fruit and Vegetable Planter	Unclear	60	120
Growise Grow Bag.	Unclear	100	200
Growise House Plant & Pot Plant Compost 20 Litre	Compost blend	170	340
Growise Potato Planter 56 Litre	Unclear	60	120
Horton 60 Litre Farmyard Manure	"Manure"	100	200
Hortons 30L Top Soil	Soil	200	400
Hortons 60 Litre Container & Potting Compost	Compost blend	70	140
Hortons 75L Decorative Mini Bark	Bark	110	220
Hortons Multi-Purpose Compost 120 Litre	Compost blend	70	140
Hortons Multi-Purpose Compost 75 Litre	Compost blend	80	160
Shamrock Potting Compost 75 Litre	Compost blend	110	220
Westland 60 Litre Multi Purpose Compost w John Innes	Compost blend	130	260
Westland Bulb Compost Pouch 10 Litre	Compost blend	330	660
Westland Cacti Compost Pouch 10 Litre	Compost blend	450	900
Westland Indoor Plant Compost 10 Litre	Compost blend	450	900
Westland Soil Conditioner 60 Litre	Unclear	130	260

**Table D-2: UK prices for compost and topsoil reported by WRAP and Which Consumer Magazine 24 February 2010**

Product	Grade	Per m <sup>3</sup>	Cost per tonne*
Ex-works bulk	0-40 mm	£3	£6
Ex-works bulk	0-5mm	£12	over £20 @ 500kg/ m <sup>3</sup>
Delivered bulk	Topsoil delivered to landscaping	-	£11- £18
Delivered bulk	Topsoil delivered to sports and leisure	-	£15-£30
Bagged retail	Multipurpose compost	-	£50 per tonne
Bagged retail	Speciality compost blends	-	Up to £1,000
Bagged retail	"Seed composts" and "growing young plant composts" (2010)	€70-290	€140-580
Bagged retail	Peat-free "Seed composts" and "growing young plant composts" (Which 2010)	€116	€232

\*Cost per tonne @ 500kg/m<sup>3</sup>

## **APPENDIX E**

## APPENDIX E - List of Operational Composting Facilities

This table lists operational composting facilities in Ireland, technology used, where known to rx3, and estimates their operational capacities.

	Composting facility name	Technology	Operational capacity, est.
1	Acorn (Ballybeg Composting) - Tipperary	IVC	45000
2	Aran Islands, Timpeallacht na nOileán	IVC	500
3	Barna Waste - Carrowbrowne, Galway	IVC	20000
4	Bord na Móna Plc - Drehid composting	IVC	24000
5	Bord na Móna Plc - Kilberry	Windrow	25,000
6	Celtic worm company	Vermi	1000
7	Coolmore Stud - Tipperary	Windrow	10,000
8	Cork City Council - Kinsale Road Landfill	Windrow	2,500
9	Cork County Council - Bandon Civic Amenity	Windrow	900
10	Crammonds - Wicklow	Windrow	1,000
11	Cremin Farm Compost - Limerick	IVC	10,000
12	CTO Environmental Ltd. - Midleton	Windrow	6,000
13	De Brun Iasc - Kerry	IVC	15,000
14	Dundalk Town Council landfill		1000
15	Enrich (Larch Hill Stud, Kilcock)	Windrow + IVC	20,000
16	Envirogrind Ltd. - Donegal	IVC	10,000
17	Galway City Council - Carrowbrowne	IVC + ASP	9,500
18	Galway County Council - Ballinasloe Composting site	IVC	1,000
19	Green King Composting Ltd - Wicklow	IVC	20,000
20	HT&T Transport		1000
21	Johnstown Recycling Ltd. - Westmeath	IVC	2,500
22	Kildangan Stud farm - Kildare	Windrow	1,000
23	Limerick County Council - Gortadroma	Windrow	1,000
24	Limerick County Council - Mungret	Windrow	5,000
25	M&T Plant Hire	IVC	10000
26	Marine Harvest - Donegal	IVC	900
27	Mayo County Council (Ballina Waste)		1000
28	McGill Environmental Coom, Glenville	IVC	20800
29	McGill Environmental, Castletownroche	IVC, bays	10,000
30	McGill Molaisin (Cappoquin)	IVC, bays	12,000
31	Milltown Composting Systems Ltd.	IVC	10,000
32	OD Recycling Ltd.	IVC, bays	10,000
33	Ormonde Organics (Portlaw, Waterford)		10,000
34	O'Toole Composting Ltd.	IVC	15,000
35	Panda Waste (Nurendale Ltd) - Meath	IVC tunnels	18,000
36	Pat Cleary Compost & Shredding	Windrow	5,000
37	Paul & Bronwyn Mooney, Maynooth, Kildare.	Windrow	2,000
38	Sligo County Council, Ballisodare	Windrow	2,000
39	Terralift Ireland Ltd.	IVC	5,000
40	Thornton's Kilmainhamwod	IVC, bays	20,800
41	Tramore Recycling Centre (WCC)	IVC	1,000
42	V&W Recycling - Louth	Windrow	1,000
43	Waddock Composting Facility	IVC	7,000
44	Waterford County Council - Dungarvan	IVC	1,000
45	Waterford County Council - Lismore Recycling Centre	IVC	500

