

## ***Theme B. Waste, Resource Management and Chemicals***

### **Overview**

The Waste, Resource Management and Chemicals thematic area of the STRIVE programme aims to provide research that will support the more effective management of wastes, resources and chemicals. The research will focus on the key challenges outlined in the SOE Report 2008 and the EPA's 2020 vision namely, meeting Landfill Directive Targets, tackling illegal waste movements, support for waste prevention initiatives, the development of our own indigenous facilities, markets and outlets to manage waste more sustainably.

The thematic area also supports the National implementation of the REACH regulation and we will focus on developing and validating new approaches, methods and models for the risk assessment of chemicals and alternative testing strategies.

A range of research activities are planned for the coming years while a big focus will be on maximising our investment through collaboration with other stakeholders.

It is envisaged that the programme will have developed significant research expertise and be recognised as a leading activity supporting evidence-based policy making and the “green knowledge economy”.

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### **1. Background and Overall Goal**

Environmental degradation can be caused in the manufacturing, distribution, usage or disposal of products and services. We currently use natural resources inefficiently and create too much waste. If current trends continue unabated, our natural resources will be depleted. To reverse this unsustainable trend, we need to move beyond controlling emissions and waste, and begin to address the more fundamental issues of **sustainable production and consumption**.

Producer responsibility initiatives ensure that the cost of collection and recycling of products when they become waste is borne by the manufacturer or importer. The EU

Directives on **waste from electrical and electronic equipment**, packaging waste and end-of-life vehicles are based on the premise of producer responsibility. Their implementation in Ireland will significantly impact the management of these important waste streams.

**Prevention** is the most desirable method of waste management since the absence of waste eliminates the need for handling, transportation, treatment and disposal. Prevention of waste provides the highest level of environmental protection, optimises the use of available resources and removes a potential source of pollution. However, as the European Environment Agency has highlighted, preventing waste continues to be one of the toughest environmental challenges as, similar to climate change issues, societal behaviour changes are needed now but without immediately tangible benefits.

**Waste generation and resource use** are increasing in Ireland in tandem with economic growth. Waste is generated by all sectors of Irish society including industry, households and agriculture. Preventing and managing waste continues to be one of the toughest environmental challenges facing Ireland.

While good progress is being made towards meeting national and EU waste recycling targets, Ireland is over-reliant on landfilling of waste. We are a long way from meeting **EU targets for diverting biodegradable waste from landfill**. Under the EU Landfill Directive, Ireland is required by 2016 to reduce its landfill of biodegradable municipal waste to 35 per cent of the amount produced in 1995 – a considerable challenge. Through tight control and regulation the number of landfills has reduced from over 100 unlined and unregulated dumps to 34 authorised municipal landfills that operate to modern EU standards.

While large-scale illegal dumping is no longer taking place in Ireland, there is evidence of a large volume of uncollected domestic waste, **fly-tipping** (sporadic, small-scale dumping), littering and uncontrolled backyard burning of waste.

The aim of the REACH Regulation is to improve the protection of human health and the environment through the better and **earlier identification** of the intrinsic properties of **chemical substances**. At the same time, innovative capability and competitiveness of the EU chemicals industry should be enhanced.

The overall goal for the Sustainable Use of Resources as outlined in the EPA's 2020 Vision document is a more efficient use of resources. Waste will be prevented and minimised, with the balance safely collected, recycled or recovered. Final disposal will be completed in a way that does not harm the environment.

### **3. Overall Aim**

The overall aim of this Thematic Area is to “Contribute to more effective waste and resource management in Ireland and seek to address environmental impacts by the development and validation of new methods to assess the environmental impacts of waste generation and management and by taking into consideration the whole life cycle of resources. We will focus on developing and validating new approaches, methods and models for the risk assessment of chemicals and alternative testing strategies”.

A key indicator of success for this Thematic Area will be evidence for support of the the National Biowaste Strategy and other policy objectives in an evidence-based way which best meets the future needs for sustainable waste and resource management in Ireland as a whole.

### **4. Our Approach**

#### **4.1 Research Needed to Meet the Goals - Planned Activities (2009/2010)**

- PhD/Fellowships in areas relating to waste technologies, waste prevention, resource management and novel toxicity testing of chemicals.
- Establishment of Large Scale Project “Waste as a resource” to Develop Technologies and Markets to deal with Biodegradable Municipal Waste

- Co-fund in association with the HEA the development and expansion of Ireland's waste research infrastructure, that advances the goal of building a modern Irish research infrastructure. Dedicated call expected to be held in 2010 under HEA/PRTL15 focussed on waste treatment technologies
- Collaborate with Science Foundation Ireland (SFI), Enterprise Ireland (EI), Health and Safety Authority (HSA), Markets Development Group (MDG) and other stakeholders in areas of mutual interest
- Initiate calls under the Environmental Technologies Measure 2 including the Cleaner Greener Production Programme and the Environment & Health Measure 3.
- Undertake review of research programme with stakeholders taking into consideration progress following stakeholders workshop in June 2006.

#### **4.2 Maximising our investment through collaboration with others**

The active co-operation of a number of key stakeholders will be required to meet the immediate targets and the overall objectives of the STRIVE programme. The thematic area will continue to be developed in consultation with the DEHLG, EPA (Licensing, OEE, Waste Prevention), HSA (REACH) and the Research Community, General Public, Local Authorities, IBEC, Industry, Markets Development Group, SFI, EI, DAFF. We will maintain contact and liaison with the EU level activities and other relevant international activities (FP7, ERA-Nets, SNIFFER, LIFE+ etc).

We will establish an expert group comprising of National and International experts that will advise the research needs of the programme.

Our approach will be to consult with the stakeholders on a bi-lateral basis in late 2009 with a view to hold a one-day workshop with stakeholders in early 2010.

We will also actively support the National review of the ETAP, which will commence in 2009. We will disseminate the findings of the individual research projects and the overall programme to the widest possible audience in a coherent and timely manner.

## 5. Intermediate Outcomes

The intermediate outcome from the Waste, Resource Management and Chemicals programme upto 2013 aims at achieving the following targets:

- Significant support for emerging international, EU and national environmental and research plans, policies and legislation<sup>1</sup>
- Input to Future DEHLG Waste Strategy Documents and other policy initiatives
- Assistance in meeting National and EU targets (BMW, WEEE)
- Demonstration projects highlighting novel technologies supporting waste enforcement and management arising from STRIVE-funded (and other leveraged funding) research<sup>2</sup>
- Support the “green knowledge economy” through effective partnership with the key stakeholders in this area (HEA, SFI, EI, MDG)
- STRIVE Researchers leverage funding from international funding programmes (e.g. FP7, LIFE+)
- Established specific and targeted knowledge brokering and dissemination mechanisms that facilitate the production of policy-relevant knowledge in a timely and effective manner
- Managed the programme to the highest standards with respect to project/programme evaluation and ensuring optimal value for money for stakeholders

### Conclusion - Overall Vision 2020

The programme will have developed significant research expertise and be recognised as a leading activity supporting evidence-based policy making and the “green knowledge economy”.

The programme will make a significant contribution to more effective waste and resource management in Ireland and will address environmental impacts by the

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<sup>1</sup> Landfill Directive, WEEE DIRECTIVE, IPPC Directive, REACH Regulation, Various Thematic Strategies arising from 6-EAP, Action Plans (ETAP, SCP, SIP), Future Waste Framework Directive

<sup>2</sup> Particular examples could be demonstrated in support of Dublin City of Science in 2012

development and validation of new methods/technologies to assess the environmental impacts of waste generation and management. Novel technologies developed under the STRIVE programme will be employed routinely by EPA staff (and others) to ensure more effective waste and resource management in Ireland.

## **Appendix 1. EPA Funded Waste Management Research**

### **ERTDI Funded Research**

In all some 22 research projects were funded under ERTDI with an equal split between those to be undertaken by private sector consultants and by research institutions. A further 14 awards support Capability Building in the field of waste management by virtue of funding Fellowships (5) and Doctorates (8). By the end of 2006 five of the private sector based projects and six of the research institution based projects had been completed.

There is a very wide diversity in the nature of the projects being supported under the heading of Waste Management. Examples of those projects funded (some not yet completed) include attitude surveys, market analysis for waste derived materials, environmental charging regimes, methodologies for conducting waste audits, evaluation of contaminants in wastes, the use of biotechnology for nutrient removal and for creating value added products from waste, and the development of biosensors for application in the waste sector. All these projects can be considered to be in keeping with the necessity to meet the requirements for appropriate waste management and have the potential to yield relevant and useful outcomes both in informing waste policy and in direct waste problem solving.

The value of a number of ERTDI research projects in the area of cleaner production, waste prevention, and market development have been highlighted in the recent National Biowaste Management Strategy document (2006). A number of projects funded under the Environmental Technologies Programme since 2005 have the potential to have significant impact in terms of providing solutions to significant environmental problems (waste plastics, landfill gas migration) and also resulting in the development of patent filings and new start-ups.

### **STRIVE Funded Research**

There were nine projects grant awarded in 2008. These include projects relating to improved waste tracking, waste prevention, LCA for major waste streams, innovative

solutions for WEEE reuse and recycling, compost application and the potential for use of “native Irish wastes” in biorefineries.

In addition, under the Environmental Technologies call a major 4-year project on the upcycling of waste plastic has been funded. A large scale project funded under the Socio-Economic Thematic area will also be very relevant in terms of Sustainable Consumption and Production.



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