



WasteKIT Central Joint Action Plan

Deliverable D4.2

Due Date	May 1 st 2011
Actual Submission Date	May 27 th 2011
Responsible Partner	Daniela Sani, ASTER
Contributors	AIM, AEB, TUD, Van Gansewinkel and Qeam, BV, BAS, BCCI, BSECEE, Denkstatt, Sofia Municipality, ITI energy, Leed University, CO2sense, Conserve Italia, CRPA, Emilia-Romagna region
Dissemination Level*	PU
Revision	10
Total number of pages	
Annexes	6



1. Executive summary

WasteKIT is a European project funded by the 'Regions of Knowledge Programme' of the European Commission and focuses on knowledge exchange regarding technology and policy options in the field of waste management. The purpose of this WasteKIT Central Joint Action Plan is to state inter-regional synergy potentials to implement improvements (e.g. policies, research, technologies and infrastructure) in the waste management sectors of the four involved regions: Emilia-Romagna region (Italy), Yorkshire and Humber region (UK), Sofia region (Bulgaria) and Amsterdam Metropolitan Area (the Netherlands). According to the European waste framework directive, WasteKIT follows the waste hierarchy, focusing on: waste valorisation (i.e by using waste as commodity); waste collection and separation; reuse and recycling of plastic; valorisation of organic fraction wastes.

A proposed WasteKIT methodology led to a profound process of selecting five Ppriority Aactions to be further worked-out in the WasteKIT Central Joint Action Plan, namely:

1. Waste to energy options & technologies
2. Plastics reuse and recycling options & technologies
3. Knowledge transfer
4. Funding & spin-off projects
5. Public perception & understanding of waste

Besides the Priority Actions, the WasteKIT Regional Joint Action Plans gave insight about several so-called 'horizontal' opportunities. They should be considered the summary of the main operative measures identified for any single Priority Actions:

- Technological innovation related to waste processing (like anaerobic digestion, gasification and incineration) has the potential to be improved across the involved regions (chapter 3).
- The Life Cycle Analysis (LCA) should be used as a fundamental approach when the current waste management practice is compared to the future ones. This should always be from the perspective that waste will follow the lowest costs and depends on legislation and the economic development of a country or a region (chapter 3 and 4).
- Obtaining the full benefits of bioplastics require purposive goal-oriented policies (in chapter 4).
- The consideration of innovative projects and programmes carried out across all regions research' centres (chapter 5).
- The 'Innovation Union' is an opportunity framework for WasteKIT spin-offs (chapter 5 and 6).
- Attitude of the general public towards waste and waste management is a key aspect for waste management projects (chapter 7).
- Engaging with relevant planning authorities and regulatory bodies is vital for permitting and planning of waste management sites (chapter 7).

For the coming period, the WasteKIT consortium will prioritise the Priority Actions of this Central Joint Action Plan. It is foreseen that some Priority Actions can be pickup within the boundaries of WasteKIT. Other Priority Actions can be labelled as WasteKIT spin-offs and need external funding to be pickup.



2. Introduction

This document gives the WasteKIT Central Joint Action Plan (JAP) in the field of certain waste management related themes and is the result of analysis and elaboration work during the WasteKIT project. The purpose of this Central Joint Action Plan is to state inter-regional synergy potentials to implement improvements (e.g. policies, research, technologies and infrastructure) in the waste management sectors of the four involved regions. Interventions and operative measures suggestions are given in the following chapters.

WasteKIT is a European project funded by the 'Regions of Knowledge Programme' of the European Commission. WasteKIT stands for 'Waste management focusing on Knowledge and Integration to create Transnational economic development' and focuses on inter-regional collaboration and knowledge exchange regarding technology and policy options in the field of several waste management-related areas. In particular, according to the (revised) European Waste Framework Directive, WasteKIT follows the waste hierarchy (see Figure 1) and focuses on: waste valorisation (i.e. by using waste as commodity and at the last phase for generating power and heat); waste collection and separation; reuse and recycling of plastic; valorisation of organic fraction wastes.

The Waste Hierarchy

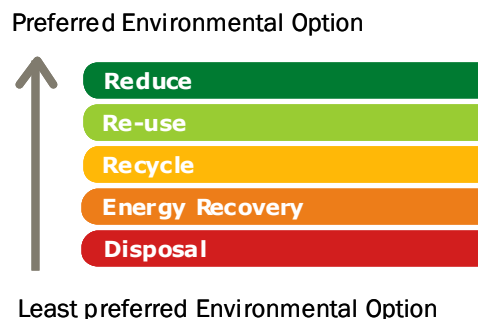


Figure 1: Waste Hierarchy

WasteKIT is seeking to stimulate knowledge transfer in the waste management sector across Europe. WasteKIT has three aims:

1. Improve waste management RTD and innovation stimulating business creation and regional economic development.
2. Expand the international roles of the WasteKIT partners with international collaboration in waste management related RTD, innovation and business creation projects and initiatives.
3. Create a European network of (regional) waste management related clusters to increase knowledge transfer.

The following regions participate in the WasteKIT project: Emilia-Romagna region (Italy), Yorkshire and Humber region (UK), Sofia region (Bulgaria) and Amsterdam Metropolitan Area



(the Netherlands). Each region is represented via the so-called triple helix actors: regional/local authorities or related organisations, knowledge institutions and companies or umbrella organisations representing companies. In total 19 consortium partners contribute to WasteKIT: 7 companies, 6 universities / academic research organisations, 4 regional/local authorities, 1 national chamber of commerce and 1 regional technology policy organisation. More information about WasteKIT can be found at: <http://www.WasteKIT.eu>.

The following methodology has led to the WasteKIT Central Joint Action Plan:

- Regional analysis: each region analysed its waste management related setting in terms of waste management history, legislation and current research and innovation frameworks dealing with waste management-related topics. This analysis resulted in four regional reports. For more information: see WP2 deliverables of WasteKIT project.
- Reflection on the regional analysis to identify common areas of interests in terms of waste management research, technology development, innovation and business development. This reflection - including a consortium workshop and resulted in a shortlist of Priority Actions. For more information: see WP3 deliverables of WasteKIT project.
- Elaboration of each region regarding its Regional Joint Action Plan: each region elaborated on its Regional Action Plan to define important (policy, research and/or technology) areas highly relevant to improve or to expand certain waste management related (research, innovation or business) aspects. For more information: see Regional Action Plan deliverables of WP4 of the WasteKIT project.
- Creation of working groups, or group of expert, commenting the regional analysis and identified opportunities. Discussion meetings (through conference call and others) with experts or policy makers (e.g. DEFRA and DECC recommendations¹ in Yorkshire and Hummer and regional conference services on waste in Emilia-Romagna region).
- Elaboration on the Priority Actions including a consortium workshop. The WP4 workshop defined collaborative actions to be carried out by partners across countries. Elaborating on collaborative actions in this way allowed groups to consider project seeds for new projects to further strengthen the waste management sectors in each region. The above-mentioned output (related to WP2, WP3 and WP4) formed the input for the WasteKIT Central Joint Action Plan development.

More information about the WasteKIT (sub) methodologies can be found in the following deliverables and documents: 'Description of analysis framework and methodology' (WP2, D2.1), 'Interregional waste management and recycling RTD and innovation and network/cluster synergies' (WP3) and 'Methodology Definition of Joint Action Plans' (WP4).

The above-mentioned WasteKIT methodology led to a profound process of selecting Priority Actions to be further worked-out in the WasteKIT Central Joint Action Plan. These five Priority Actions are given in the table below. Each Priority Action is presented in the coming chapters, including concrete suggestions for intervention and operative measures (labelled as 'action plans') in the waste management sector (see Table 1).

¹ DECC is the UK Department of Energy and Climate Change (<http://www.decc.gov.uk>). DEFRA is the UK Department for Environment, Food and Rural Affairs (<http://www.defra.gov.uk>).



Besides the Priority Actions, the WasteKIT methodology gave insight about several so-called 'horizontal' opportunities. They should be considered as the summary of the main operative measures identified for any single Priority Action. They are listed in Table 2.

Priority Actions of the WasteKIT Central Joint Action Plan

1. Waste to energy options & technologies
 2. Plastics reuse and recycling options & technologies
 3. Knowledge transfer
 4. Funding & spin-off projects
 5. Public perception & understanding of waste
-

Table 1: Priority Actions of the WasteKIT Central Joint Action Plan

Horizontal opportunities as outcome of the WasteKIT Project

- Technological innovation related to waste processing (like anaerobic digestion, gasification and incineration) has the potential to be improved across the involved regions (chapter 3).
 - The Life Cycle Analysis (LCA) should be used as a fundamental approach when the current waste management practice is compared to the future ones. This should always be from the perspective that waste will follow the lowest costs and depends on legislation and the economic development of a country or a region (chapter 3 and 4).
 - Obtaining the full benefits of bioplastics require purposive goal-oriented policies (in chapter 4).
 - The consideration of innovative projects and programmes carried out across all regions research' centres (chapter 5).
 - The 'Innovation Union' is an opportunity framework for WasteKIT spin-offs (chapter 5 and 6).
 - Attitude of the general public towards waste and waste management is a key aspect for waste management projects (chapter 7).
 - Engaging with relevant planning authorities and regulatory bodies is vital for permitting and planning of waste management sites (chapter 7).
-

Table 2: Identified horizontal opportunities of the WasteKIT Project

WasteKIT project focuses on the collaboration potentials among (involved) regions in the field of waste management RTD, innovation and business development. The table below gives the identified relative strengths in the field of waste management of the involved four regions. This strengths identification is based on performed WasteKIT activities (see results and deliverables of WP2, WP3 and WP4). These identified strengths identified for each region's waste management sector form the basis for further exploitation in the remainder of the WasteKIT Project.



Identified strengths in the field of waste management of each region

Amsterdam Metropolitan Area	Best overall waste management performance. Potential to mentor other regions on sustainable waste management.
Sofia region	Uniquely placed to learn about various aspects of waste management from the other regions. It has the most potential to innovate in waste management through business practice and RTD.
Emilia-Romagna region	Concentrated cluster of facilities and infrastructure processing bio-waste and agro-wastes.
Yorkshire and Humber region	Well-established waste materials market & provides a high level of business support.

Table 3: four regions and their relative strengths in the field of waste management

This WasteKIT Central Joint Action Plan sets out a comprehensive list of invention and operative measures that addresses the opportunities positioned across the regions. Actions may be short term or longer term in a period of time indicated following the completion of the project. The report will provide also an overview of the intervention and operative measures in order to be implemented at least at WasteKIT consortium level. More in general, the WasteKIT Central Joint Action Plan will be implemented by the consortium regions to make improvements to the waste management sector.

For the coming period, the WasteKIT consortium will prioritise the Priority Actions of this Central Joint Action Plan. It is foreseen that some Priority Actions can be pickup within the boundaries of WasteKIT. Other Priority Actions can be labelled as WasteKIT spin-offs and need external funding to be pickup. See the appendix for the first version of this prioritisation.

The action plans, prepared by the regional clusters, will be presented to a set-up regional working groups focusing on waste management, in order to make improvements to the waste management sector itself.



3. Priority Action 1: Waste to energy options & technologies

3.1. Context analysis

Waste to energy (W2E) covers a variety of methods to process/convert waste into energy. An important focus is the improvement of waste to energy concepts in order to become a method that is equal to recycling in the last stage of the lifecycle of materials. In other words: at the end of the lifecycle of any material, the last stage is to reclaim its energetic value and to regain this in the best possible way.

Process technology for waste separation, and outline generic technologies available in the world marketplace are examined too.

Several methods can be used for waste to energy. Besides waste fired power plants (WFPP), the last decades a variety of waste to energy concepts are developed:

- Gasification installations
- Anaerobic digesting installations to produce green gas, which can be used for so-called cogeneration installations (combined heat and power; CHP) as an alternative for LPG, LNG and natural gas
- Biomass power plants that runs on 100% biomass.

Historically, there are four phases to define in WFPP. These phases represent the development of WFPP from an accepted solution for waste conversion to a solution compared with (materials) recycling.

- First phase: reduce the amounts of waste via a burning process. Compared to landfill this can be seen as a definitive and “clean” solution.
- Second phase: reduce emissions caused by the burning process of waste.
- Third phase: maximize electrical/energy efficiency of the waste to energy power plants.
- Fourth phase: to maximize the efficiency on materials recovery and to minimize the residues related to the process, in order to become a solution next to recycling.

An important focus for this Priority Action 'Waste to energy options and technologies' is the improvement of waste to energy concepts in order to become a method that is equal to recycling in the last stage of the lifecycle of materials. In other words: at the end of the lifecycle of any material, the last stage is to reclaim its energetic value and to regain this in the best possible way. Another relevant topic is process technology for waste separation. From communication perspective is it important to outline waste to energy technologies available in the world marketplace.

Another important development is the recovery of materials and the transfer of slack in high valuable commodities. Pilots are run with remarkable results. This development has a positive effect on the gate fees² because the slack is transformed into valuable commodities.

² Charge levied upon a given quantity of waste received at a waste processing facility.



3.2. *Intervention and operative measures*

The WasteKIT methodology (see chapter 1) led to the definition of various relevant intervention and operative measures related to waste to energy options and technologies for the WasteKIT consortium, both in terms of activities and expertise.

- **Analyse locally Life Cycle Analysis of waste to energy options**

Life Cycle Analysis (LCA) is a tool for assessment of the efficiency of practices and innovation processes for municipal waste treatment. This assessment is used as a fundamental approach when the current waste management practice is compared to future ones. The trend is to estimate the environmental and social implications assignable to products and services and to be able to choose the least burdensome one. Base on this analysis better stakeholder dialogue could be lead in order to track the process of acceptance the innovations by presenting the results from LCA analysis (in chapter 3 and 4). According to the WasteKIT cluster it seems that a more balanced strategy, based on bring-up separate collection expanded up to its highest possible separation records and direct incineration of residuals is the most reasonable one. This aspect seems particularly relevant when compared to other technologies, as examples anaerobic digestion. Nevertheless, Life Cycle Analysis should be used as a fundamental approach when current waste management practice is compared to future ones. This should always be from the perspective that waste will follow the lowest costs and depends on legislation and the economic development of a country or region.

Moreover, the so-called the EPE protocol (protocol for the quantification of greenhouse gases emissions from waste management activities) is more and more becoming the standard for LCA towards waste management. For example, Vereniging Afvalbedrijven (Dutch association of waste companies) is in the decision-making process of adopting this as the standard for the Dutch waste sector. This model is developed by a cluster of French companies³ and calculates the effects on greenhouse gasses for every method of reuse, recycling, W2E and other ways of waste disposal. It is suggested that local Life Cycle Analysis should take into account the EPE model in order to create a standard and find a way to compare each waste management technique on its effectiveness.

- **Exchange information about 'Energy from Waste' technologies**

Education and knowledge transfer of the various technologies need improvement, especially for the separation and preparation of waste for 'Energy from Waste' processing from municipal solid waste, commercial and industrial waste and construction waste sources. There are a lot of similarities in each region with regards to understanding suitable technologies for improved waste management (see WasteKIT WP2 and WP3 deliverables). This includes common issues relating to the use and benefits of these technologies with government departments, local planning authorities, environmental agents, NGO's and lobby groups, general public and the risks perceived by project investors.

WasteKIT cluster can operate in improving knowledge transfer. In particular, it could be obtained by developing an Energy from Waste Decision Making Toolkit (EfW DMT). Such an EfW DMT will be part of the Mentoring Guide and related online portal with best

³ The website <http://www.epe-asso.org> gives an overview of these companies labelled as 'Entreprises pour l'Environnement'.



practices (see WP6 and Action Priority 6). The DMT should be very general in order to be used in many situations. It would be not scientific but more informative / educational and based on existing knowledge and concepts published within the domains of the IEA Bioenergy tasks (task 36: integrating energy recovery into solid waste management systems; task 37: energy from biogas and landfill gas). The EfW DMT will also be aligned with the PEP Toolkit (Public Engagement & Perception; see Priority Action 5). More information about the EfW DMT: see WP4 deliverable 'Yorkshire and Humber Regional Joint Action Plan').

- **Improve energy efficiency of WFPP via synergies**

Improve energy efficiency of WFPP via solutions found in synergies with other plants and facilities. This aspect is very important at EU level, also. According to the WasteKIT Project, this measure can be tackled via research programs and pilots to be promoted during future activities.

WFPP have several development phases representing the development of WFPP from an accepted solution for waste conversion (waste to energy) to a solution compared with (materials) recycling. The recovery of materials and commodities after the burning process is to be considerate as an alternative for pre-separation (economically and environmentally). For example: slack from MSW is the richest one in the world.

Further background information: WP2 deliverable 'Analysis report regarding the Amsterdam Metropolitan Area' and WP4 deliverable 'Amsterdam Metropolitan Area Regional Joint Action Plan'.

- **Analysis support regarding MBT plant and RDF in Bulgaria**

Support Bulgarian country in additional option analysis to assess the viability of MBT plant with RDF production and MBT plant without RDF production. This aspect is quite relevant to fit well the Sofia municipality district with EU requirements. Define long term strategic waste management goals in Sofia is the first step, than look at techniques that are affordable en helps to achieve the long-term goals is the second one. Help should be done thinking of the people's perspective and the law of the lowest costs. In some cases a standard waste to energy plant (like WFPP) is not feasible. In these cases alternative waste to energy options need to be assessed, like alternatives based on MBT (Mechanical Biological Treatment) processes with or without options for RDF (Refuse-Derived Fuel) production. In Sofia (Bulgaria), studies are needed to make proper waste management and investment decisions in the field of MBT and RDF. Further background information: WP4 deliverable 'Sofia Regional Joint Action Plan'.

3.3. Further considerations

The following follow-up could be expected from WasteKIT partners according to the aforementioned measures.

Firstly, linkages will be made with the WasteKIT WPs dealing with the Mentoring Guide (WP6) and dissemination (WP7) and with the Priority Action 'Knowledge Transfer' (see chapter 5 of this document).



Secondly, Sofia Municipality would like to take the lead regarding MBT plant and RDF (it has been chosen as waste treatment technologies and project plans has been submitted to the EC for funding). Support will come from other consortium partners and other stakeholders. Consortium partners ITI Energy Ltd and AEB will lead actions with the support of University of Leeds, CO2Sense and others like CRPA.



4. Priority Action 2: Plastics reuse and recycling options & technologies

4.1. Context analysis

Waste plastics have attracted much attention due to the high quantities produced, potential economic value from recycling and recovery and the stringent European and local government policies in regard to diverting waste plastics from landfill. The objectives of this action concerning 'options for plastics' are to increase reuse, recycling and recovery of waste plastics in order to stimulate waste plastic management RTD, innovation and business creation. More information about the relationship between plastics and the waste hierarchy (Lansink's Ladder) is given in the WP4 Amsterdam Metropolitan Area Regional Joint Action Plan.

An important aspect of this Priority Action 'Plastics reuse and recycling options and technologies' is bioplastics. Bioplastics are plastics totally or partially produced from renewable resources. A large proportion of certified (EN13432) compostable plastic products available on the market contain a high portion of renewable raw materials. However, bio-based polymers are not in all cases biodegradable and compostable. Bioplastics tend to have a generally very high consumer acceptance.

As with conventional plastics, bioplastics have a very broad application spectrum. Commercial success occurs above all when the particular properties can be transformed into useful product functionality and added value. Environmental aspects are important, too, and many bioplastics products are still being used in areas where compostability represents a significant benefit (e.g. collection bags for compost, agricultural foils, graveyard or nursery products). Other applications such as packaging and technical applications are gaining importance.

Bioplastics tend to have a generally very high consumer acceptance.

More information about bioplastics is given in the WP4 Emilia-Romagna Regional Joint Action Plan and European Bioplastics (2008).

Most of the intervention and operative measures regarding waste plastics outlined in the four WasteKIT Regional Joint Action Plans and this WasteKIT Central Joint Action Plan are out of scope and expertise of the current WasteKIT project. In general, waste plastics production and recycling need to be studied in the four involved regions and possibly in other European countries, including investigation of current successful practices of recycling of waste plastics and current innovative technologies regarding processing.

4.2. Intervention and operative measures

Regarding the Priority Action 'Plastics reuse and recycling options and technologies' the WasteKIT consortium was less able to define intervention and operative measures fitting within the current setting of the WasteKIT project. The defined measures will be performed during future WasteKIT activities.



- **Stimulate Life Cycle Analysis regarding waste options for plastics**

Waste management options for plastics depend on local conditions and the Life Cycle Analysis (LCA). Although both energy recovery and mechanical recycling processes provide environmentally friendly alternatives to manage plastics, a comparison between recycling options could be of benefit. LCA models need be validated by the EPE model which seems to become an industry standard. For more information about the EPE model see Priority Action 1, Amsterdam Metropolitan Area Regional Joint Action Plan (WP4) and EPE (2010),

More background information about plastics and waste management: WP4 deliverables 'Amsterdam Metropolitan Area Regional Joint Action Plan' and 'Emilia-Romagna Regional Joint Action Plan'.

The WasteKIT network will stimulate information gathering about performed LCA on waste plastics. Additionally, the WasteKIT project will invite students (the Netherlands; potentially in other countries) to elaborate on waste options for plastics (including LCA) via a paper competition in Q4 2011. More information: see WP5 workshops proposals.

- **Stimulate purposive goal-oriented policies for innovations in bioplastics**

Obtaining the full benefits of the bioplastics require purposive goal-oriented policies. WasteKIT stimulates the exchange of information about policy options for innovations in bioplastics.

- **Stimulate introduction of biodegradable packaging**

Introducing the biodegradable packaging and related incentive to apply these materials in the near future. Bio-based polymers are not in all cases biodegradable and compostable. At present, the development of compostable bioplastics is receiving more attention than non-biodegradable or biodegradable plastics. WasteKIT stimulates the exchange of information about biodegradable plastics and biodegradable packaging.

- **Identify new market opportunities for recycled materials**

Technological developments will significantly affect market developments and new business opportunities for recycled plastics (see e.g. Plastic reuse and recycling roadmap regarding The Netherlands, Innovatie Zuid, 2009). Therefore, identify new markets and new market opportunities for recycled materials and aiming to ensure the involvement of all the "stakeholders" is strategic. But it's out of the opportunities offered by WasteKIT project, especially in case of positive results of the research to ensure an effective industrialization.

- **Stimulate research into sustainable materials and product design**

Part of the recycling problem of plastics is that manufacturers use many different types of plastic in their products (see e.g. PlasticsEurope, 2010). If manufacturers could be encouraged to bring more uniformity in their choice of plastic, the recycling could be done much more effectively and under better economical conditions. This requires research and technical innovations in product design to support companies in switching to a limited number of different plastics. Therefore, stimulate research into sustainable materials and product design according to the philosophy of 'Cradle to Cradle' is



strategic. WasteKIT aims to stimulate the exchange of information about plastics, product design and Cradle to Cradle.

4.3. Further considerations

The following follow-up could be expected from WasteKIT partners according to the aforementioned measures:

- linkages will be made with the WasteKIT WPs dealing with the Mentoring Guide (WP6) and dissemination (WP7) and with the Priority Action 'Knowledge Transfer' (see chapter 5 of this document);
- consortium partners Van Gansewinkel and TUD (both the Netherlands) organize the paper competition on waste options for plastics (see WP5);
- possible linkages with INTERREG CENTRAL project PLASTiCE⁴ – Aster is partner – will be exploited in 2001-2012 years. PLASTiCE deals with bio-plastic market stimulation and many initiative of promotion of bio-plastic will be performed during 3 years project life time.

Moreover, beyond the WasteKIT project, further research projects could be explored among the existing partners of WasteKIT. There are various research points that could be found from this project based on management, RTD and innovative technology development for waste plastics. A development of a steering group and investment strategy on bioplastic by involving a mixture of local authorities, waste management companies, collectors, reprocessors, manufacturers, retailers and technology developers, is one of these.

The group should feedback before inputting into the development of a strategy to attract investment/funding to develop new, regional recycling capacity and bioplastic upgrading in manufacturing process as well.

⁴ PLASTiCE is: "Creating framework conditions for enhancing the development of the biodegradable plastics market in Central Europe as an innovative test bed for new product applications in selected industries. It focuses on improving the climate for innovation in production and application of biodegradable plastics among companies in Central Europe and in removing the bottlenecks in the diffusion and application of innovations in biodegradable plastics.



5. Priority Action 3: Knowledge transfer

5.1. Context analysis

This ‘horizontal’ Priority Action focuses on knowledge transfer and highlights various domains of knowledge transfer like educational programs, innovation-oriented networking and valorisation (knowledge transfer from academic scene to the market).

Knowledge transfer plays a key role in the technology transfer processes because technology cannot be transferred if there is no knowledge to be transferred. Technology transfer, understood as the movement of science and technology from one group to another, will only be achievable if academic, policy makers and companies are involved in the process of knowledge transfer. Therefore, knowledge transfer and technology transfer most work together at the same rate of development to achieve transfer and guarantee the system’s innovation.

Both topics of Knowledge and Technology Transfer are of fundamental importance as a vehicle for development, helping to strengthen the competitiveness of enterprises, improvement of technical-scientific knowledge and its practical application in the production system, and more generally to the economic and scientific development.

Sustainable or “green” products appear to be driving a recent R&D/manufacturing related boom within Europe. In order to aid this economic growth, WasteKIT will explore opportunities to support and invest in a number of knowledge technology areas. The valorisation of Innovation Platforms (including European, national and regional technological platforms) – the main arena of knowledge transfer – should be supported by means of a number of programmes and delivery mechanisms to drive innovation, such as the European Commission initiative ‘Innovation Union’. Example of Regional Technological Platforms are given in the WP4 deliverable ‘Emilia-Romagna Regional Joint Action Plan’.

Concepts should include newly developed technology or a change to technology. Concepts for new and innovative recycled content products or products and technology designed to reduce consumption and waste generation. New technologies or methods to improve product or packaging design should also be included.

More elaborations and background information on various aspects and elements related to or dealing with knowledge and technology transfer can be found in the four WasteKIT Regional Joint Action Plans (WP4).

5.2. Intervention and operative measures

Knowledge transfer is one of the main assets of the WasteKIT project consortium. Many measures coming from the other Priority Actions could be easily linked to this Priority Action as well. Within the setting of WasteKIT the following intervention and operative measures are suggested.



- **Organise support for a European Technology Platform 'Waste' for roadmap-based innovation stimulation and support**

Waste management is - due to its fundamental linkages with society, sustainability, process management and manufacturing - an important domain in the European arena of RTD, innovation and competitiveness. This is shown by the fact that 'recycling' and 'bio-based products' are defined as important sectors under the umbrella of the Lead Market Initiative (EC, 2009). Vehicles to enhance European competitiveness are the different European Technology Platforms (ETP)⁵. They were set up as industry-led stakeholder forums to define medium to long-term research and technological objectives and developing roadmaps to achieve them. Currently, waste management is not yet defined as a European Technology Platform domain and WasteKIT sees it as an important challenge to look for support for a European Technology Platform 'Waste'. As a main activity of the platform it could be suggested the realisation of technological scenarios / roadmaps to provide ways and means to identify expected developments in the next 4/5 years and compare these developments with international and European scene(s). In this way, the platform will (indirectly) support innovation and knowledge transfer towards the industry.

It should be suited to organise support for a European Technology Platform 'Waste' for roadmap-based innovation stimulation and support.

- **Facilitate innovation-oriented networking of stakeholders**

The project WasteKIT in itself is already a platform to facilitate innovation-orientated networking of stakeholders within and across the involved regions. Nevertheless, this networking facility should be extended in terms of organisation and online potentials. This also relates to the intentions to define an online variant of the mentoring guide (see chapter 6).

Facilitate innovation-oriented networking of stakeholders within and across the involved regions. The WasteKIT network is a 'fresh' starting point for orientations, organisation and actions.

- **Provide strategic and investment support for collaboration projects**

Provide strategic or potentially investment support. Through the WasteKIT project relationships between (all stakeholders related to) companies and regional academic institutions have been strengthened.

- **Analyse need for specific education programs on waste management**

Education programs and professional courses on waste related problems or technology are significant. Looking at the industrial needs and challenges for waste management the needs for specific education programs in the field of waste management and technology should be analysed. Further elaboration: see WP4 deliverable 'Amsterdam Metropolitan Area Regional JAP'.

Analyse in the different involved regions the (industry-driven) need for specific education programs (various levels; from vocational level to master's level) focusing on waste management or specific themes related to waste management. Exchange findings among the involved regions and define follow-up actions.

⁵ Overview of European Technology Platforms: <http://cordis.europa.eu/technology-platforms>



- **Facilitate innovation-oriented networking of stakeholders**

The project WasteKIT in itself is already a platform to facilitate innovation-orientated networking of stakeholders within and across the involved regions. Nevertheless, this networking facility should be extended in terms of organisation and online potentials. This also relates to the intentions to define an online variant of the mentoring guide (see chapter 6).

Facilitate innovation-oriented networking of stakeholders within and across the involved regions. The WasteKIT network is a ‘fresh’ starting point for orientations, organisation and actions.

5.3. Further considerations

The WasteKIT project encourages knowledge transfer by the structure of its partners (i.e. a WasteKIT triple helix model):

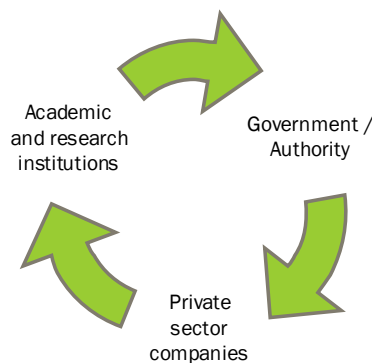


Figure 2: Triple helix model adopted in WasteKIT project

This structure of regional partners has several opportunities. Moreover, the WasteKIT project has been very successful in developing regional communication linkages. The feasibility of creating a new online network to be hosted by one of the WasteKIT partners or a member of their extended “cluster” should be considered. The network ideally would incorporate learning from each region. A monthly newsletter could be sent through the network. The network should use various internet-based push and pull channels to communicate / share latest waste management related news, research and data sharing best practice.

For these operative measures linkages will be made with the WasteKIT WPs dealing with the Mentoring Guide (WP6) and dissemination (WP7).



6. Priority Action 4: Funding & spin-off projects

6.1. Context analysis

The term “funding” in the context of this WasteKIT Central Joint Action Plan has a broad definition. It is all funding or finance available to assist, secure and develop new or existing waste management processes (innovation), facilities and infrastructure (i.e. new plant). “Funding” also captures funding support or investment available to new product or service concepts from research and development (R&D). The term “funding” also covers inward investment and funding available to support new research projects (Figure 3).

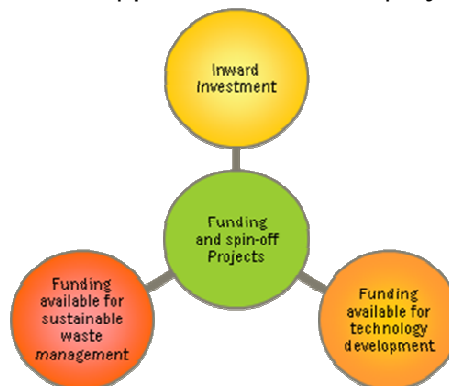


Figure 3: Funding and spin-off projects proposed model

The WasteKIT WP3 report ‘Interregional waste management and recycling RTD and innovation and network/cluster synergies’ cites that access to finance is a key threat for the development of waste management for all involved WasteKIT regions. Currently, businesses in all sectors face difficulties in raising funding due to the recession. Bank funding is more accessible when companies can offer collateral as security, which is good for existing businesses but not always possible for start-up companies. For private investors their concerns will be about key risks that they face relating to planning consents and uncertainty around regulatory changes. Investors will also want assurance that adequate feedstock is available for any (waste processing) plants and that there is a ready market for outputs. Delivering certainty has perhaps been the key success factor in those Member States which are most advanced in their development of infrastructure, and this is even more important with regard to financing new waste treatment facilities. Analysing what financial approaches are taken within these countries gives the less advanced countries clear considerations on how they may amend their approach to avoid risk and create a greater stability.

The ‘Innovation Union’ is a European Commission Europe 2020 Flagship Initiative that aims to do three things: make Europe into a world-class science performer; remove obstacles to innovation (like expensive patenting, market fragmentation, slow standard-setting and skills shortages) which currently prevent ideas getting quickly to market; and revolutionise the way public and private sectors work together, notably through Innovation Partnerships between the



European institutions, national and regional authorities and business.⁶ This new European initiative could give access at funding for future WasteKIT spin-offs. The term “spin-off” in the context of this WasteKIT Central Joint Action Plan includes any project (including new EU projects submitted), consultancy or concrete case analysed and/or investigated during project’s lifetime or after the project’s lifetime but based on concrete steps initiated via the WasteKIT project.

More information about funding in relationship with waste management is given in the various WP2, WP3 and WP4 deliverables.

6.2. Intervention and operative measures

Within the setting of WasteKIT the following intervention and operative measures related to the Priority Action ‘Funding & Spin-off’ are suggested.

- **Share funding and tender opportunities**

The WasteKIT Project has identified common or universal areas for improvement in the waste management sectors of each region. A number of partners, or in some cases the entire consortium, require further research to be implemented to assess the feasibility facilitating a change e.g. encouraging a change in policy or adopting an innovative waste management practice.

The WasteKIT project has linked a number of partners together for future spin-off projects. Therefore, share funding and tender opportunities and apply for European subsidies and tenders for waste management is the identified operative measure.

- **Facilitate the identification how EU regions stimulate the uptake of a product, technology or amendment to technology**

Each EU region has its own economical and institutional setting to stimulate the uptake of a product, technology or amendment to technology. WasteKIT sees it as an opportunity to identify how EU regions perform those stimulation measures looking at waste management themes. This will be done by considering the following (research) questions:

- Can each region and the rest of that Country glean best practice from the WasteKIT regions and/or other European regions encouraging sustainable products to market at a faster rate? These products will have been made from recycled material, or have been designed in a way waste (packaging) is minimised. Consideration will be given to how new products sourced from the waste management sector stimulates regional economies.
- How can the involved partners become internationally more competitive in the waste management related R&D field? Can these regions position themselves as an international exemplar?
- Do the Amsterdam Metropolitan Area, the Emilia-Romagna region, the Yorkshire & Humber region and the Sofia region have mechanisms to broker leverage of private sector investment?

⁶ <http://ec.europa.eu/research/innovation-union>



Such a new project could collect case studies and interviews from each WasteKIT region detailing how each region stimulates the uptake of a waste management product, technology or amendment to technology. Where necessary, new case studies will be recorded and published. To strengthen case studies interviews will be conducted to record and isolate barriers and options to overcome barriers to getting a product to market.

Projects will produce a synthesis report pinpointing viable options for local authorities/regional bodies to incubate concepts through to established products, services or businesses.

- **Transform Mentoring Guide into a web-based platform**

WasteKIT will develop and offer a so-called Mentoring Guide to help local governments to define their ultimate long-term waste management goals and first steps on the road to sustainable waste management. For more information: see WasteKIT WP6. In order to make this Mentoring Guide better accessible, an online variant should be developed. This webpage can become an online portal for waste management industries and their customers. The idea is that the platform should support local government's needs to develop a broader vision with respect to local waste management and sustainability. In this way, governments are better able to think and act beyond single-focused approaches of waste management solutions. They can find solutions, techniques and companies to help them develop and realise their vision.

This will turnaround the process from 'technology/solution push' to 'technology/solution pull'. Decision makers can find solutions for their actual problems and launch questions more precise towards actors active on the commercial market. , Advantage is that these actors do not waste time on projects that in the end seams not the right answer to the problems.

To start up this online portal project, additional funding must be found.

6.3. Further considerations

There are three popular funding schemes, which can be referenced and exploited in WasteKIT. Each of these schemes can be used as a source of finance for some of the activities envisaged under technical expertise part, or pilot actions implementations, regenerations, integration of new technologies to reduce costs pollutions etc. In particular, from closing EU programme like JASPERS (Joint Assistance to Support Projects in European Regions), ELENA (European Local ENergy Assistance) and JESSICA (Joint European Support for Sustainable Investment in City Areas)⁷. More recently, the NER300 Funding Programme (New Entrants Reserve with a budget of 300 million euro) focuses on the financing of commercial demonstration projects that aim at the environmentally safe capture and geological storage of CO₂, as well as demonstration projects of innovative renewable energy technologies under the scheme for greenhouse gas emission allowance trading within the Community, established by Directive 2003/87/EC.⁸

⁷ JASPERS: <http://www.jaspers-europa-info.org>; ELENA: http://www.eib.org/products/technical_assistance/elena; JESSICA: http://www.eib.org/products/technical_assistance/jessica

⁸ <http://ec.europa.eu/clima/funding/ner300>



7. Priority Action 5: Public perception & understanding of waste

7.1. Context analysis

In terms of public opinion regarding waste management/treatment plants and valorisation of waste in general, the last few years have seen a gradual but noticeable increase in intolerance, regardless of the type of plant or process.

When specifically examining plants that produce energy and heat using biomass (dedicated, by-products and residues; vegetable, animal, and urban), public opinion in the past had been favourable enough to consider them as low-impact. They were seen as normal industrial plants not subject to the resistance, which is typical for waste treatment plants. No unease was felt, even in the case of plants with notable production capacity (e.g. 10MW). This is no longer the case today.

It is to be considerate that the development in the area on people behaviour is subject to many research projects. New insights on how to influence people behaviour is concentrating on two types of behaviour is conscious behaviour and subconscious behaviour. Both need to be influenced. Several strategies depending on the goals and topics are being developed in order to influence both behaviours. The insights on how to influence people behaviour are more the less universal; research should be done on the differences

Here too, communication and public awareness campaigns, in the face of a direct economic benefit, have been shown to be of little effect. As an example, consider promotional campaigns regarding recycling. Generally, these have poor results if not appropriately accompanied by increased visibility regarding the results and advantages obtained in comparison to the effort expended.

Mere communication through the media may be enough to sell products, but it is not adequate to create a consensus for a plant. The economic factor is the only one that reinforces and determines the decision of a community taken for granted and that is assured that all technical specifications (impacts on transportation, the environment, and health) have been fully satisfied.

7.2. Intervention and operative measures

Within the setting of WasteKIT the following intervention and operative measures related to 'Public perception & understanding of waste' are suggested.

- **Collaborative research to define Best Practices in Public Engagement & Perception (PEP) regarding waste**

Further funding will be explored to carry out detailed literature searches across the involved regions and any new stakeholder regions to determine how Public Engagement



& Perception (PEP) regarding waste (management) is delivered regionally and internationally.

Based on available research data identified partners will consider the best approaches to PEP delivery and consider the feasibility of each in terms of:

- Technology availability and effectiveness
- Economics of the delivery method
- Timescales of method development
- Longevity of the PEP action and the renewal timescales
- Effective communication of output

All sectors of waste management will be considered and best practices in each area identified. High profile exemplar studies will be highlighted in terms of their effectiveness and ease of implementation. Different types of media will be considered and a measure of their effectiveness defined.

- **Give clear & proper information about waste management to the public**

Clear and proper information about waste management and its impact on the environment is one of the main aspect to put into success local policy in accord with waste hierarchy. This should be done in many different way by means of promotional campaign. One of this is the public presentation of regional results and objective during specialised in waste management trade fair, like Ecomondo⁹.

During WasteKIT activities the project will realise a totem info point during Ecomondo trade fair, with the aim to disseminate project results and the goals obtained by different cluster on waste management. At the same time, the info point will allows to populate the dissemination database (as part of work packages 5 and 7) and to identify key stakeholders for the proposed spin-off PEP project.

The totem info point will be managed by Emilia-Romagna Region.

- **Develop a Public Engagement & Perception (PEP) Toolkit**

The majority of regional actions for Priority Action 'Public perception & understanding' could be exploited by building a Public Engagement & Perception (PEP) Toolkit. The toolkit should include: an educational programme (which underpins the PEP Toolkit; see also Priority Action 4 focusing on the need for specific education programs on waste management) and scoping of information and development of an evidence base. This would contain best practice across the four regions of PEP. Case studies, skills audits of staff delivering PEP programmes and a programme to initiate improvements to existing PEP programmes in place would be engineered.

The toolkit itself - guidelines for the engagement of waste management professionals with the general public, policy makers and media in different areas of waste management will be compiled. These will provide details of appropriate language and glossary terms for use when interacting with the public. The toolkit will also provide templates and examples of press releases and FAQs. It is recognised that this is a developing area of science and engineering with new concepts being developed at a

⁹ <http://www.ecomondo.com/> The biggest expo of green technologies and new lifestyles, a special forum where businesses in the environmental and sustainability sectors can meet institutional stakeholders, trade associations, local/central government, NGO's and all types of industries and goods manufacturers, to discuss new models of economic growth driven by a focus on innovation, clean technologies and a new approach to urbanization and social contexts.



rapid rate. Therefore, many of the tools provided will be available in a combination of electronic documents (pdf or Word templates) and HTML. Therefore, a website for the PEP Toolkit will be developed to allow easy updates and provide news items highlighting good examples of public engagement. The toolkit will have a focus on educating the public, key stakeholders and planning authorities on the benefits of waste management facilities. The toolkit will be aligned with the following other WasteKIT toolkits: Mentoring Guide and its related online platform (WP6) and the Energy from Waste Decision Making Toolkit (EfW DMT; see Priority Action 'Waste to energy options & technologies'). More information: WP4 deliverable 'Yorkshire and Humber Regional Joint Action Plan'.

7.3. Further considerations

Several strategies depending on the goals and topics are being developed in order to influence both conscious and subconscious behaviours. For example: in trying to have the people properly separate garbage in order to realise the right commodities for the recycle and reuse industry, the main focus must be to influence the subconscious behaviour this is the part where we do things automatically.¹⁰ Insights in this field should be input for the PEP Toolkit so decision makers can set out a targeted strategy in order to convince the public for implementing the necessary steps to realise there long-term waste management goals.

For these operative measures linkages will be made with the WasteKIT WPs dealing with the mentoring guide, transformed in a web-based portal (WP6), data base and dissemination (WP7).

¹⁰ For example, in the Netherlands experience is build-up in dealing with this subconscious behaviour, also taking into account the Dutch cultural setting. See e.g. Pol (2011).



8. References

AIM (2009), Sustainable innovations: Innovators in the Amsterdam Metropolitan Area

Andrady, Neal (2009), Applications and societal benefits of plastics. Phil. Trans. R. Soc. B 364, 1977–1984. <http://rstb.royalsocietypublishing.org/content/364/1526/1977.full.pdf> [accessed the 26th May 2011]

Bianchini, Pellegrini & Sacconi (2011), Material and Energy Recovery in Integrated Waste Management System. Part B: An Italian case study on the quality of MSW data. Department of Mechanical Engineering, Faculty of Engineering, University of Bologna, Bologna, Italy, National PRIN project.

BIOCHEM (2009), Assessment of the Bio-based Products Market Potential for Innovation, deliverable D2.3 of the Eco Innovation project BIOCHEM

Consonni & Viganò (2009), Material and Energy Recovery in Integrated Waste Management System: The potential for energy recovery. LEAP - Laboratorio Energia Ambiente Piacenza, Piacenza, Italy, National PRIN project

Consonni, Giugliano, Massarutto, Ragazzi & Sacconi (2009), Material and Energy Recovery in Integrated Waste Management System. Project overview and main results. National PRIN project

COREPLA (2009), Sintesi dei risultati 2009

EC (2009), Mid-term review of the implementation of the Lead Market Initiative, http://ec.europa.eu/enterprise/policies/innovation/files/swd_lmi_midterm_progress.pdf [accessed the 26th May 2011]

EC (2010), plastic waste in the environment. Report by BIO Intelligence Service for the European Commission DG ENV

EC (2010), Strengthening the role of European Technology Platforms in addressing Europe's Grand Societal Challenges, Report of the ETP Expert Group, ftp://ftp.cordis.europa.eu/pub/etp/docs/fa-industrialresearch-b5-full-publication-rp_en.pdf [accessed the 26th May 2011]

EESC (2011), Toegang tot secundaire grondstoffen. European Economic and Social Committee (EESC)

EPE protocol (2010), Protocol for the quantification of greenhouse gases emissions from waste management activities, <http://www.epe-asso.org/> [accessed the 26th May 2011]

European Bioplastics (2008), Bioplastics: Frequently Asked Questions, www.european-bioplastics.org/download.php?download=Bioplastics_FAQ.pdf [accessed 11 January 2011]

Gemeente Amsterdam (2007), Amsterdam duurzaam aan de top: Milieubeleidsplan Amsterdam 2007-2010

Gemeente Amsterdam (2010), Information brochure: 'Afval = Grondstof in de havenregio Amsterdam-Zaanstad'. Publication of Nieuw Amsterdam Klimaat, <http://www.nieuwamsterdamsklimaat.nl> [accessed the 26th May 2011]



Gemeente Amsterdam (2010), Kerncijfers Amsterdam 2010

Hopewell, Dvorak, Kosior (2009), Plastics recycling: challenges and opportunities, Phil. Trans. R. Soc. B364, 2115-2126, <http://rstb.royalsocietypublishing.org/content/364/1526/2115.full.pdf> [accessed the 26th May 2011]

IEA bioenergy, Publications: Task 36 2007 – 2009 Accomplishments from IEA Bioenergy Task 36: Integrating Energy Recovery into Solid Waste Management Systems (2007-2009) http://www.ieabioenergytask36.org/publications_2007_2009.htm [accessed the 26th May 2011]

Innovatie Zuid (2009), Procesindustrie: Kunststofrecycling in Zuid Nederland – roadmap

K+V (2009), Onderzoek gemeentelijke inzameling kunststof verpakkingen

L.R. Pol Venoot Tabula Rasa, Behavioral Science Institute Radboud University, Psychologie Maastricht University, Em. lector Overheidscommunicatie HU)

Massarutto, De Carli & Graffi (2010), Material and Energy Recovery in Integrated Waste Management Systems. Part F: Economic Analysis. National PRIN project

Ministry of Economic Affairs (2011), Naar de top: de hoofdlijnen van het nieuwe bedrijfslevenbeleid
OECD (2000), The Bioeconomy to 2030: designing a policy agenda, <http://www.oecd.org/futures/bioeconomy/2030> [accessed 11 January 2011]

P+ (2010), Terug naar de tekentafel. P+ Magazine, November + December 2010

PlasticsEurope (2010), Plastics – the Facts 2010: an analysis of European plastics production, demand and recovery for 2009

Pol, Swankhuisen & Fenni (2002) Communicatie en gedragsbeïnvloeding. Kluwer, Alphen aan den Rijn.
SER (2010), Meer chemie tussen groen en groei: De kansen en dilemma's van een biobased economy
Smith (2008), The New Face of Bioplastics, European Plastics News, www.europeanplasticsnews.com/subscriber/index.html [accessed 11 January 2011]

Thompson, Moore, Vom Saal & Swan (2009), Plastics, the environment and human health: current consensus and future trends. Phil. Trans. R. Soc. B 364, 2153–2166, <http://rstb.royalsocietypublishing.org/content/364/1526/2153.full.pdf> [accessed the 26th May 2011]

Thompson, Swan, Moore & Vom Saal (2009), Our plastic age. Phil. Trans. R. Soc. B 364, 1973–1976

VROM (2010a), Landelijk afvalbeheerplan (LAP2). [Http://www.lap2.nl](http://www.lap2.nl)

VROM (2010b), Landelijk afvalbeheerplan 2009-2021. Naar een materiaalketenbeleid

WasteKIT (2010), Analysis Report on Amsterdam Metropolitan Area. Report related to WP2

WasteKIT (2010), Analysis Report on Emilia-Romagna Region. Report related to WP2

WasteKIT (2010), Analysis Report on Sofia Municipality District. Report related to WP2

WasteKIT (2010), Analysis Report on Yorkshire and Humber Region. Report related to WP2



WasteKIT (2010), Interregional waste management and recycling RTD and innovation and network/cluster synergies. Report related to WP3

WasteKIT (2011), Amsterdam Metropolitan Area Regional Joint Action Plan. Report related to WP4

WasteKIT (2011), Emilia-Romagna Regional Joint Action Plan. Report related to WP4

WasteKIT (2011), Sofia Regional Joint Action Plan. Report related to WP4

WasteKIT (2011), Yorkshire and Humber Regional Joint Action Plan. Report related to WP4



9. Appendix: first indications to prioritise WasteKIT follow-up

This appendix gives a first indication of the prioritisation of the given Priority Actions in this WasteKIT Central Joint Action Plan. This prioritisation can be based on the following categorisation (see table 4 and 5). In particular, categories 1 and 2 imply that they are part of the project, instead categories 3 and 4 need funding to be realised as WasteKIT follow-up.

Position of Priority Action / Priority level of Priority Action	Part of WasteKIT project	WasteKIT spin-off
High priority	Category 1	Category 3
Low priority	Category 2	Category 4

Table 4: Suggestion to categorise and prioritise the Priority Actions of the WasteKIT Central Joint Action Plan

Measures of WasteKIT Central Joint Action Plan	Part of WasteKIT Priority Action *	Indications of follow-up category **	Remark
Analyse locally Life Cycle Analysis of waste to energy options	1	2	Compare/validate with EPE protocol
Exchange information about 'Energy from Waste' technologies	1	1	
Improve energy efficiency of WFPP via synergies	1	3	
Analysis support regarding MBT plant and RDF in Bulgaria	1	3	
Stimulate Life Cycle Analysis regarding waste options for plastics	2	3	Compare/validate with EPE protocol
Stimulate purposive goal-oriented policies for innovations in bioplastics	2	4	Investigate synergies and opportunities with PLASTiCE
Stimulate introduction of biodegradable packaging	2	4	Investigate synergies and opportunities with PLASTiCE
Identify new market opportunities for recycled materials	2	3	
Stimulate research into sustainable materials and product design	2	3	
Organise support for a European Technology Platform 'Waste' for	3	2	Possibilities within portal of mentoring guide



roadmap-based innovation stimulation and support			
Facilitate innovation-oriented networking of stakeholders	3	1	Possibilities within portal of mentoring guide
Provide strategic and investment support for collaboration projects	3	1	
Analyse need for specific education programs on waste management	3	2	
Facilitate innovation-oriented networking of stakeholders	3	1	Possibilities within portal of mentoring guide
Share funding and tender opportunities	4	1	
Facilitate the identification how EU regions stimulate the uptake of a product, technology or amendment to technology	4	2	
Transform Mentoring Guide into a web-based platform	4	1	
Collaborative research to define Best Practices in Public Engagement & Perception (PEP) regarding waste	5	2	
Develop a Public Engagement and & Perception (PEP) Toolkit	5	2	
Stimulate PEP through a totem info point	5	1	Possibility to be exploited during Ecomondo 2011 trade fair
<p>NOTE:</p> <p>*</p> <p>1 = Waste to energy options & technologies; 2 = Plastics reuse and recycling options & technologies; 3 = Knowledge transfer; 4 = Funding & spin-off projects; 5 = Public perception & understanding of waste.</p> <p>**</p> <p>1 = high priority and part of WasteKIT; 2 = low priority and part of WasteKIT; 3 = high-priority and WasteKIT spin-off (need for funding); 4 = low priority and WasteKIT spin-off (need for funding).</p>			

Table 5: Indications to categorise and to prioritise the Priority Actions of the WasteKIT Central Joint Action Plan