Phase 3
Evaluation Report

June 2006

ARUP

Interreg North Sea Region

Making Waste Work

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Ove Arup & Partners Ltd
Central Square, Forth Street, Newcastle upon Tyne NE1 3PL
Tel +44 (0)191 261 6080 Fax +44 (0)191 261 7879

Forsyth Business Centre, Dunedin House, Riverside Columbia Drive, Stockton on Tees TS17 6BJ
Tel: +44 (0)1642 626 364 Fax: +44 (0)1642 626 362
www. arup.com

Job number 118777/00

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Appendix A

Contact Details

1 Introduction

"Making Waste Work" is an INTERREG IIIB project developed by a cross sector partnership from Denmark, England, Germany, Norway and Sweden looking at practical strategies to achieve waste minimisation and effective waste management processes. In particular it involves the municipalities of Stockton on Tees (England), Moss (Norway), Falköping (Sweden), Aaskov (Denmark) and TuTech of Hamburg.

The Aim of the project is:

"To produce a sustainable waste management strategy that minimises the volume of waste produced, manages it in a more sustainable way and develops public motivation and awareness of waste issues."

Five main **Objectives** have been agreed. They are:

- To highlight the importance of sustainable waste management practice at all levels of the community.
- To set practical baselines for comparison and improvement.
- To jointly run local projects to explore and test new methods and approaches in three **key areas**:
    - **Waste Management Systems**
    - **Employment & Business Opportunities**
    - **Public Motivation & Awareness**
- To exploit the opportunity for cross-sectoral working.
- To develop positive answers to spatial planning issues such as land use (landfill) and integrating actions between communities.

The project is supported under the INTERREG North Sea Programme IIIB. An application for assistance was submitted in March 2003 and approved May 2003.

The specific section of the North Sea Programme that supports this project is:

- Measure 3.3 - Development and promotion of sustainable management of natural resources and renewable energies

Stockton on Tees is the Lead Partner for the project and, in September 2005, appointed Arup to prepare this independent Evaluation Report to establish the extent to which the project objectives were achieved, measured against a series of indicators and targets which had been defined at the outset.

2 Project Partners

2.1 Aaskov

Aaskov (Demark) is a rural municipality with a population of around 7,000.

2.2 Hamburg

Hamburg (Germany) is a city state of approximately 1.7 million inhabitants. The contribution from Hamburg has been focused through TuTech University.

2.3 Falköping

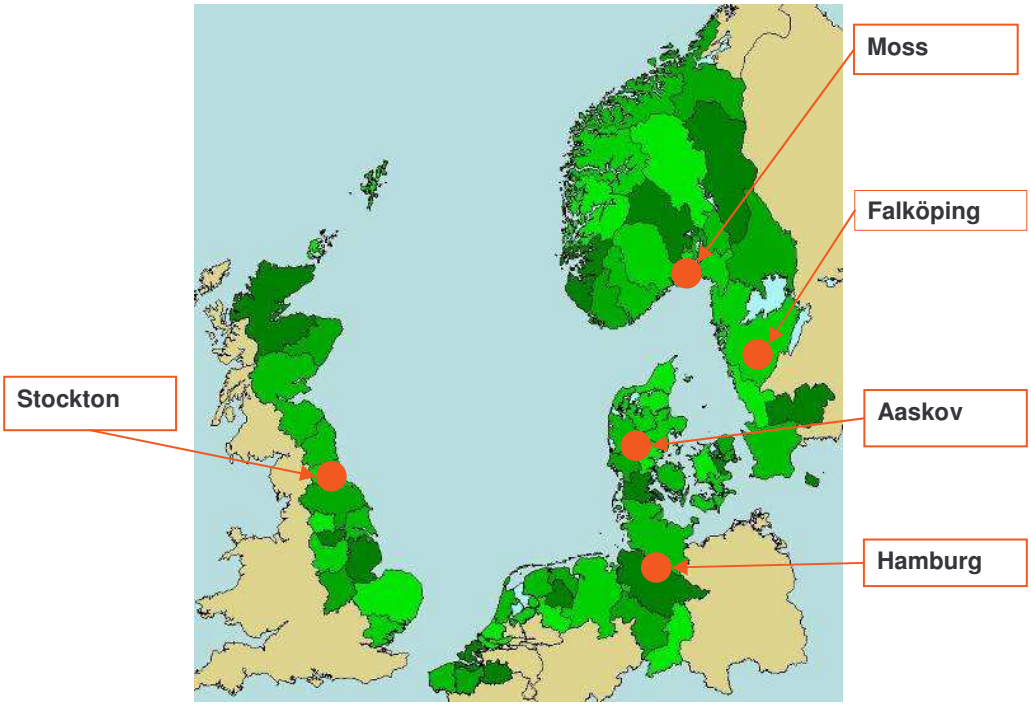
Falköping (Sweden) is a municipality with a population of around 31,000 in the Skaraborg area of the West of Sweden.

2.4 Moss

Moss (Norway) is a rural municipality with a population of around 27,000.

2.5 Stockton-on-Tees

Stockton-on-Tees (England) has a population of approximately 176,000 and is largely urban with some small rural villages.



3 Project Objectives

The five key objectives for the project to achieve are:

- To highlight the important of sustainable waste management practice at all levels of the community.
- To set practical baselines for comparison and improvement.
- To jointly run local projects to explore and test new methods and approaches in three **key areas**:
  - **Waste Management Systems**
  - **Employment & Business Opportunities**
  - **Public Motivation & Awareness**
- To exploit the opportunity for cross-sectoral working
- To develop positive answers to spatial planning issues such as land use (landfill) and integrating actions between communities.

3.1 Waste Management Systems

Looking at different technical solutions, issues of public concern and future trends. Specifically, working together on piloting local initiatives and helping each partner to understand and apply up-to-date methods and taking into account trends, health issues and future directives. Also, for each of the partners there will be a joint learning and comparing of methods of management of public waste sites so as to come up with some basic principles of “Best Practice”.

3.2 Employment & Business Opportunities

For all the partners there is interest as to how local markets for re-cycled materials can be stimulated i.e. thereby reducing transport costs and pressures. Between us we plan to use the project to develop a number of practical and universal proposals to encourage employment and commercial markets from our work together on this project.

3.3 Public Motivation and Awareness

From the earliest days of planning this project, it was recognised that the people element of achieving better waste management is all-important. This project will help all the partners with public motivation work in their own municipalities. It was also planned to have a big impact on young people and the networks created through this project will make this interesting and exciting.

In addition, there is planning for a pilot **Waste Education Centre**. This is an education and information resource for use by schools, the public and waste management professionals. Joint planning and design will lead to a practical model that can be implemented in different municipalities. This will be an important and innovative measure – something that more and more municipalities should consider in the future.

3.4 Project Indicators

The following project indicators were established as measures of success, either at the outset, or after completion of the Baseline Studies in Phase 1 of the project.

Project activities indicators

	Baseline	Target	Unit
Number of organisations involved in the project	5	50	No.
Number of people (directly) involved in the project	15	175	No.
Number and nature of publications and press coverage	0	35	No.
Networks established as part of the project	1	6	No.
Cross Sectoral character of project participants	2	5	No.
Number of meetings of the partnership	0	7	No.
Number of exchange and information events	1	15	3 per country
Number of jointly developed local waste management initiatives	0	10	2 per country
Number of public information campaigns	0	10	2 per country

Output indicators

	Baseline	Target	Unit
Number of strategies for sustainable management of resources	0	3	No.
Baselines from key project areas/subjects established	0	4	No.
Best practice examples corresponding to baseline areas established	0	4	No.
Project website established	0	1	No.
Number of small infrastructure projects as part of local waste management initiatives completed	0	5	No.
Waste education Facilities Centre pilot achieved	0	1	No.
Young persons information network established	0	1	No.

Result indicators

	Baseline	Target	Unit
Amount (%) of waste diverted from landfill measured against baseline	86.7%	+10%	% +/-
Amount (kg/person) of household waste diverted to composting	33.0 kg	+10%	% +/-
Higher recycling % rates measured against baseline as a result of local initiatives	22.4%	+10%	% +/-
% Increase in numbers measured against baseline using public waste sites *	Not measured	+10%	% +/-
Number of people employed in SME's in waste sector measured against baseline	6451	+5%	% +/-
Awareness of Waste and Recycling Issues in target groups from start of project and measured against baseline	62.40%	+10%	% +/-

** It was agreed that this indicator should be abandoned as it proved impractical to measure a baseline position.*

Impact indicators

	Baseline	Target	Unit
Decrease in amount of waste going to landfill (relative to trend in total volume of waste produced.) Environmental impact indicator.	13.3%	-10%	% +/-
Project findings and recommendations incorporated in regional waste strategies	0	3	No.
Continuing cross sectoral and transnational networks	0	3	No.
% Reduction in waste produced (kg/person) measured against baseline and set against national trends	444 kg	-5%	% +/-

4 Project Activities

4.1 Phasing

Activities in this project are planned and grouped within four phases or project milestones. They are:

Milestone 1: Understanding Common Issues 6 months

- Preparatory work by all partners will focus on establishing baselines. There are three baseline studies corresponding to the three strands of the project. The three strands are, Waste Management Systems, Employment and Business Opportunities and Public Motivation and Awareness.
- In addition, in this phase of the project we will plan in detail the local implementation projects within each of the three themes above. All partners will jointly plan and design the local implementation projects which will include - ways of managing difficult waste fractions, centralised composting schemes, pilot school/office recycling projects, a young persons network and information, education and publicity campaigns. Planning for joint development of a model Waste Learning Facilities Centre will also take place.
- Information Dissemination and cross sectoral working will be accomplished by Technical Forums and the project website. The first meetings of the Technical Forums that will be developed by each partner will take place in this milestone.
- Two steering group meetings will be held.

Milestone 2: Implementing Joint Actions 21 months

- The focus of this phase of the project is the Local Implementation Projects that correspond to the three strands of the project. These will be joint projects with all partners participating and are planned to maximise the benefit of sharing the different experience and expertise that the partners bring to the project. Each partner will implement at least one of the projects in their country. The Local Implementation Projects will include:
  - Measures to increase employment in the waste and recycling sector;
  - Actions to expand opportunities for local use of locally recycled materials;
  - Techniques of identifying and disposing of difficult waste fractions;
  - Ways to promote general issues around public education and waste minimisation.
- Also, there will be joint development of a Pilot model of the Waste Education Facilities Centre. The concept that will be explored is of a resource centre with a key role in educating and motivating the public about issues related to waste. The objective will be to produce a model that will serve as a tool for others considering such a facility.
- The Technical Forums will be held every four to six months.
- At least two steering group meetings will be held and specialist technical exchanges will take place.
- Information dissemination will take place through a number of different channels, including reports to professional organisations, regional bodies, through the website and through the Technical Forums.

Milestone 3: Recommend and Evaluate 6 months

- In this phase each element of the project will be subject to separate assessment in terms of the contribution made to achieving the objectives of the project.
- A key area of work in this phase will be compiling the conclusions and results from the Local Implementation Projects that all the partners have been involved in.
- It is at this point that Best Practice guides will be finalised.
- Another major area of work will be a joint assessment and review of new methods and practices of waste management that have been explored and shared during the project with lists of recommendations agreed and finalised.
- Following this a draft plan for follow up actions and more collaborative working after the project has finished will be drawn up, a further steering group meeting will take place and a draft programme for dissemination of the project's results and findings with proposed presentations and symposia will be confirmed. A strategy for continuing the website will also be agreed and a draft Final Report will be prepared.

Milestone 4: Reporting, Dissemination and Conclusion 3 months

- In the last stage of the project a Steering Group Meeting will agree the draft of the Final Report, Best Practice guides and recommendations will be agreed and printed and a strategy for continuing the website will be implemented.
- Also, a programme of Follow up actions (Exit Strategy) will be confirmed
- Finally a programme of presentations and dissemination of the project results will be implemented. Also, as part of the dissemination of the findings and results of the project a final steering group meeting will be held and plans will be made to continue the collaborative working that the project has facilitated.

4.2 Steering Group Meetings

Eight Steering Group Meetings have been held, as follows:

Date	Location
August 2003	Stockton
November 2003	Hamburg
April 2004	Aaskov
September 2004	Copenhagen
May 2005	Moss
October 2005	Copenhagen
March 2006	Falköping
May 2006	Stockton

4.3 Baseline Comparisons

A separate document summarising the baseline work has been produced and is available on the project website http://waste.tec-hh.net. This section only picks out the key points from that document.

4.3.1 Waste Management Systems

Led by Moss

Each partner was asked to submit information on the waste collection systems they operated, the recycling facilities provided, the quantities of the different fractions of waste collected and what happens to it.

All partners already collected a variety of information on this subject area for a number of reasons such as measuring performance against targets and financial and accounting purposes. The year 2002 was taken as the baseline as that was the last complete year prior to the project commencing in June 2003.

There were some difficulties in comparing the information provided as not all partners were using the standardised European Codes to define waste, however after some discussions it was possible to pull together sufficient information to set baseline indicators and to provide a direction for some useful local implementation projects.

Summary of Results

There were similarities with refuse collection services but interesting differences in technical systems e.g. Falköping collection – twin bag system – organic and non organic – separated by the householder.

Also all partners offered some sort of drop off/bring type stations where householders can deposit recyclables.

But – significant differences in how waste was then divided into landfill, incineration (with energy recovery) composted or recycled. Here it was possible to identify individual strengths and practice – for example the Danish example of composting green waste.

Also, common problems quickly emerged. Everyone is struggling to deal with difficult waste such as CCA treated wood, batteries, electronic toys etc.

Several of the above points are the subject of pilot projects now being developed.

Also, this baseline survey led to an important additional piece of work which summarised the main legislative drivers for each partner. These differed significantly in respect of certain areas even within the context of European harmonisation and therefore had a major impact on waste collection and waste management systems (see section 4.4).

4.3.2 Employment Opportunities

Led by Stockton & TuTech

This was measured using a survey form that each partner was asked to complete with information relating to:

- The level of business activity in the waste and recycling sector
- The % employed in waste & recycling sector
- Views of local businesses
- The level of processing of recyclable material within the area

The main difficulty experienced here was the lack of quality information in this area of business activity.

It also required some extensive work in contacting local businesses to gather more accurate information

Summary of Results

Business activity (the number of waste or recycling businesses as a percentage of the whole business community) in all partner areas was very low in this sector, ranging from 0.06% in Hamburg to 1.04% in Moss.

The actual number of people employed in the waste sector was also measured as a percentage of the whole population in employment to consider whether although the number of businesses existing were small did that mean few people were employed? It was difficult to answer this question as there was a limited amount of data although in both Hamburg (0.78%) and in Falköping (0.39%) the waste sector does appear to be labour intensive.

However, an important result is that this has led to closer contact with many businesses and publicized the project among them. This, in turn, has helped with the formation of technical forums and gaining business representation on these.

4.3.3 Public Motivation

Led by Falköping and Aaskov

Two target groups were identified – children (within two age groups) and their parents. The questionnaires developed for this study were to be used by each partner as a template to which other questions could be added or the terminology could be adjusted to fit the local situation. The questionnaires were designed to be used by parents and children in two age ranges / school year groups which were 13-14 yr olds and 10-12 yr olds.

By asking the parents of the schoolchildren it enabled a more accurate comparison of results where both children and adults would have the same waste management systems in place in their households.

The sample sizes and response rates varied in each municipality with Stockton receiving completed questionnaires from 17 households and Hamburg 193.

Summary of Results

According to the survey of adults 94% did sort their waste at home and sorted a variety of different fractions according to the services that were made available by the municipality. There were significant differences in the level of households composting at home among the partners with Aaskov achieving 94% and Hamburg 43% while Moss responses indicate 13% of households were composting.

Around 25% of households did not know what happened to their unsorted waste, and when they did answer suggesting either landfill or incineration this was not always mirrored by what actual happened to their waste.

When asked if they would return excessive packaging to the store 45% said they would.

Difficulties in measuring the motivation and awareness in children proved problematic due to different questions being asked, school structures were dissimilar and that the emphasis on recycling issues in each country is different. Therefore the results could only be presented for each country with the intention to measure progress over the period of the project by repeating the exercise within each group as it was originally carried out.

In Falköping over half of the children said they always / often recycle their waste and 23% wanted more knowledge in waste issues.

The Hamburg children surveyed, in the 10 – 12 year old range, said that half of them had compost bins, and around 2/3rd had a box for glass bottles and a very high level of awareness existed (85%) when it came to knowing the purpose of the recycling stations. Nearly 64% felt that there was no excuse not to sort their waste although 24% felt that it was too much work. The older children in Hamburg thought that the amount of waste will increase in future and although about half of them did not want to know more about waste issues they were split on where the best place to learn more would be with 59% favouring the school and 44% supporting the TV or newspapers.

The 8th grade children in Moss felt it was absolutely “out” to wear second hand clothes from charity shops although 87% think it’s good for the environment to sort their waste. Almost half of them said they recycle their waste but 72% were not concerned at the level of packaging around the goods they purchased. Children in the 4th grade showed a good awareness of the purpose of recycling stations and a good understanding of the amount of waste that can be recycled with most of them knowing that new materials can be made from waste.

In Aaskov the children knew that the waste was collected every two weeks and believed that it was burned. Only 25% had boxes to sort the cans and glass although a large proportion did have compost bins at home.

Stockton children were divided in who they thought was responsible for the waste they throw away with 36% saying it was themselves and 39% the Council. Although they were united in thinking rubbish caused damage to the environment and thinking they threw away too much rubbish.

The clear message that can be drawn form the surveys on awareness within schools is that there needs to be more information and teaching on specific tailored waste management issues that are relevant to the recycling and waste management services being provided within the community.

4.4 Legislative Drivers

The summary given below is only a small element of what has proved an extremely useful reference report. This report on legislative comparisons was specifically requested by the partners after the experience of trying to compare waste management systems across Europe. A full copy of the report may be downloaded from the documents section at the project website http://waste.tec-hh.net

Main Differences

Waste definitions

UK – The practical definition of municipal waste is not consistent with the EU definition and instead of covering all waste which is similar to household waste it only covers that which is collected and disposed of by or on behalf of the local authorities. This is a smaller quantity of waste. The EC definition of municipal waste appears to include different wastes in different countries. Germany – In Germany the definition of waste given in the EU waste framework directive has been interpreted slightly differently by the inclusion of defining ‘waste for recovery’ as waste that is recovered and ‘waste for disposal’ as that which is not recovered.

Municipal Waste

Apart from the definitions discussed above there are no major differences in the drivers behind the management of municipal waste as it is being highly dictated by European legislation. Some differences do occur in the way disposal is considered which are discussed below.

Other Wastes

As with municipal waste much of the direction on other wastes such as hazardous waste, and specific materials in commercial and industrial waste is provided by EC legislation there are no major differences between the countries studied.

Waste Collection

The emphasis on collection of waste by licensed carriers and segregation of waste for recycling (which is most prevalent in Germany for non household waste) is common to all countries. Denmark, Germany, Sweden and more recently the UK have all legislated for the separate collection of materials for recycling from the kerbside.

Charging fees for the collection of waste is standard in commercial and industrial sectors due to private contractors being employed by the producers however charging individual households for waste collection differs across the countries.

Waste Disposal

The main differences in policy and legislation concerning waste disposal are in how the waste hierarchy and a move towards waste management techniques higher up it are being implemented.

This falls into two main categories, how the countries ensure increasing levels of good quality recycling and how residual waste disposal is being moved away from landfill and towards recovery of energy and possibly materials.

Both Denmark and Sweden have banned the deposit of combustible waste to landfill, thus ensuring a move towards energy recovery through incineration or other thermal treatment method. In addition, from 1 January 2005 Sweden will ban the land filling of organic waste. In Germany only waste which is not suitable for recycling (in which thermal treatment with energy recovery is included) can be deposited in landfill. This effectively has the same effect as in Denmark and Sweden. In addition Germany put some emphasis on mechanical and biological treatment of waste.

In the UK several things are banned or being banned from landfill including tyres.

The authorities around the country have targets to reduce the amount of biodegradable waste going landfill. There is not the emphasis on incineration with energy recovery as with the other countries.

Waste Licensing

As EC legislation dictates the need for licensing of waste carriers and waste treatment and disposal facilities there are no major differences in waste licensing between the countries.

Conclusions

Aside from the main factors driving the direction of waste management and waste management legislation in the studied countries, a number of conclusions can be drawn from the study carried out.

I. EC legislation is drawing the focus of waste management across Europe close together and is the main driver for waste management in the countries studied at present.

II. Environmental considerations for waste management before and after the introduction of EC legislation such as the landfill directive have been developed by each country at different times but have come to very similar ends.

III. It is accepted that a reduction in the quantity of waste sent to landfill is required however the UK does not have the same assumption that incineration is to play a prominent role as the other countries.

IV. There are good grounds for the development of a joint waste strategy as many of the underlying drivers and principles for waste management in each of the countries are already the same.

V. The full political context in each country has not been considered in this study and should be considered when developing a joint strategy.

4.5 Local Technical Forums

4.5.1 Stockton

Six Local Technical Forums (LTFs) have been held in Stockton. These have engaged local businesses, the Voluntary (or Third) Sector and various public sector bodies, with the intention of:

- Disseminating Information
- Acting as a Review Group
- Assisting Networking between Sectors
- Looking at Business and Employment Opportunities
- Raising Awareness

A wide variety of speakers and presentations have been arranged (including some other MWW Project Partners) and attendances have steadily grown from 20-30 to approximately 90 at the event in November 2004.

As a direct result of participation in the LTFs, a scheme to collect and recycle redundant PCs at Haverton Hill Recycling Centre was established between Sita (the site operator) and ‘Recycling.co.uk’, improving recycling and potentially creating employment. Similarly, a scheme to refurbish and reuse furniture established by FRADE (Furniture Reclamation and Delivery Enterprise), SFS (Settlement Furniture Services), Sita and Stockton and Middlesbrough Councils.

Other initiatives that have developed as a result of the LTFs include a car dismantling scheme in Hartlepool, similar to PARS (see section 4.8.10), and the establishment of the ‘Wastees’ website (www.wastees.org.uk).

4.5.2 Hamburg

Three LTF's have been held in Hamburg.

Over two days in December 2004, 24 experts were assembled to discuss Innovative Approaches to Public Information and Awareness on Waste Management, including delegates from other MWW Project Partners. The programme included a visit to a local composting plant.

In November 2005, two events addressed the "Economic Dimensions of Waste Management", and a group of waste management authorities and companies local to Hamburg was assembled to discuss the future of Waste Management in the city.

4.5.3 Falköping

Five LTFs have been arranged in Falköping, comprising three small 'Focus Groups' and two larger seminars. The Focus Groups have separately involved:

- Waste Management companies
- Environmental chief officers from six local municipalities
- Landlords and owners of residential flats.

The two seminars have concentrated on:

- Waste Management in schools, including presentations on the 'Green Flag' concept
- Waste issues for local companies/businesses, mainly manufacturing

Between 6 and 123 delegates attended the events, which have provided excellent opportunities for the local authority to both disseminate and collect information.

4.5.4 Aaskov

In Aaskov, a Technical Forum group with 10-11 members was established and has met on four occasions. Members were recruited from regional authorities, waste management companies and local businesses. The purpose of the group was to share and develop new ideas and business opportunities in waste management, improve awareness about waste issues and disseminate information about the MWW project. Some external speakers were arranged. The Technical Forum has delivered on LIP8, the Task Force Waste project. Two other Forums were subsequently established, one focused on Education (directing LIP7, Waste Minimisation in Schools, and linking with the Green Flag/Eco-Schools initiative and the Young Persons Network) and one focused on developing the Waste Education Centre concept (see section 4.6.4).

The Forums are considered to have been very helpful, in encouraging initiatives that would not otherwise have happened.

The pending merger, in 2007, with neighbouring municipalities to create a larger authority (Herning) has perhaps discouraged longer term initiatives.

4.5.5 Moss

In Moss, three Technical Fora topics were identified, as follows:

- Hazardous and infectious waste
- EE (Electrical & Electronic) Waste
- Waste Fractions

Separate groups were formed to examine each topic, and these met as necessary on various occasions.

The first group examined the issue of preventing pollution or the spread of infection from the disposal of infectious waste from primary healthcare. There are currently no regulations in place in Norway to legislate for this waste stream, and it became apparent that records of the production and disposal of such waste were incomplete. A questionnaire survey was undertaken, which has provided a good overview of quantities of waste and their disposal routes, and it is evident that infectious waste (including 'sharps') from small producers can often end up in the residual waste stream. Hospitals and large medical centres have better disposal practices, often via specialist laboratories. It is hoped that the project will continue, to enable Moss to benefit by sharing best practice with other partner municipalities, such as collection points at pharmacies.

The second Forum, about EE waste, met once and was linked to the Young Persons Network (see section 4.7) and LIP6 (see section 4.8.6). Teachers and pupils discussed the project and received a briefing about EE waste collection and recycling from Hans Loken of 'El Retur', the firm that handles EE waste across Norway.

The third Forum, about waste fractions, met on five occasions, with the aim of increasing the amounts of kerbside segregated dry, recyclables, as Moss lags well behind the national average. The group, from the waste disposal companies of Moss and neighbouring authorities, together with recycling companies concluded that better public information about what can be recycled is essential, best achieved by a dedicated information officer. It was noted that enabling the collection of plastics increased the amounts of paper/cardboard and glass/metal which are separated, and that differential charging (more expensive for residual waste) could be a good incentive to improved recycling.

4.6 Waste Education Centres

At the start of the project, Stockton had aspirations to promote a built development to serve as a regional education resource for visiting school parties, and as an advice and training centre in waste issues for businesses and the community. It was to act as a potential template for consideration by the other project partners (Moss decided not to pursue this aspect of the project).

4.6.1 Stockton

The development of the concept of the WEC project at Stockton has been progressed by Stockton Council, Renew Tees Valley and SITA, the local waste management operator. The scope of the project as an Education Centre was defined, detailed architects plans were drawn up, a Business Plan was compiled, and a site was identified adjacent to the existing Teesside Energy from Waste plant and Household Waste Facility operated by SITA. The capital value of the scheme is approximately £0.5m.

Funding was sought from the SITA Environmental Trust, an independent charitable trust which distributes funds raised by the Landfill Tax Credit scheme. Unfortunately, the application was rejected and could not be pursued further.

The concept is therefore now being amended to incorporate social enterprise businesses, linked to recycling, generating employment for which other grant funding may be available. An ERDF funding application is to be submitted and planning consent has been granted.

The work to date has confirmed the WEC as a relevant concept, although it is recognised that each municipality would need to significantly adapt the scheme as appropriate to local needs and circumstances.

4.6.2 Hamburg

In Hamburg, the WEC concept has been considered in collaboration with the local waste authority (Stadtreinigung Hamburg), and it has been concluded that it should not comprise a single location/building, but a decentralised 'facility' which:

- provides teaching resources ('waste suitcases') which are supplied to teachers in schools to enable them to raise waste awareness among pupils by delivery of lessons about waste as part of the environmental and science curriculum;
- which improves information and advice to the public when they deliver waste to each of the 15 waste recycling centres in Hamburg.

The project is ongoing.

4.6.3 Falköping

There was insufficient funding to develop a built WEC in Falköping and so it was decided that the project would comprise a mobile exhibition, for school pupils (linked to LIP1), adults and the waste management industry.

Initially, an exhibition was set up in the Dalenium Science Centre and will go on tour to other locations and municipalities during the autumn of 2005.

In addition, improved signage at the Falköping recycling station was set up to improve the understanding of adults about better waste sorting and treatment processes.

4.6.4 Aaskov

In Aaskov, the concept of a WEC has been developed as a Regional Centre of expertise for the Midtjylland Region in the new Herning municipality that Aaskov will become a part of from 2007. It would be used by school pupils, the community, businesses and visiting delegations to promote "new and sustainable waste handling methods".

The concept has been developed by a 'WEC Forum' steering group and the Interreg project has contributed towards the costs of preparing the Business Plan. Architects scheme drawings and an outline cost estimate have been prepared, and funding is being sought. It is hoped that the project can be developed at the Herning Municipality Waste recycling centre at Nederkjaergaard within two years.

4.7 Young Persons Network

The Young Persons Network which has been established links schools/pupils in each of the five municipalities, facilitating a series of exchange visits and correspondence/email links, aided by the MWW website. Focused strongly on waste issues, and linked to various of the LIP projects, the benefits of the programme have nonetheless been far more wide ranging in respect of cultural aspects.

The following schools have been involved:

- Stockton - Blakestone School
- Falköping - Fredrikbergs School
- Moss - - Hoppern School
- Aaskov - Soender Felding School

Exchange visits have included:

- Falköping, October 2004

  - involving groups of pupils, aged 13-15, who participated in presentations, and educational visits, including up to the WEC exhibition at Dalenium.

- Stockton, March 2005
  - involving the same pupils in lessons, presentations and visits including to Cowpen Bewley Country Park and Teesmouth Field Centre at Hartlepool. A workshop was held to identify elements of a Waste Education Centre which would be attractive to this age group.

- Cuxhaven, September 2005
  - involving students from Stockton and Aaskov, who participated in workshop sessions, about waste issues, which have been developed as part of the Re-Art One exhibition (see section 4.8.9).

In Aaskov, an Educational Forum was established, linked to the Green Flag/Eco-Schools programme.

In Hamburg, the Network is established as an internet forum for teenage students, linked to ZSU (the local centre for School Biology and Environmental Education) and to workshops associated with the Re-Art One Exhibition (see LIP9).

For each of the initiatives, it has been emphasised that the planning of exchange trips must take place well in advance (more than a year), that classroom resources and waste awareness must be closely linked to the school curriculum, and that the role and contribution of teachers is crucial – their enthusiasm and commitment are essential for the networks to function effectively.

4.8 Local Implementation Projects

The following Local Implementation Projects were progressed:

Ref. No.	Project Title	Partner	Brief Description	Lead Officer	Links to other LIPs
LIP1	School education programme	Falköping	A school education programme developed by teachers & pupils	Lars Uhlin & Klas Larsson	6, 7 & 9
LIP2	Organic waste collection system for flats	Falköping	Develop & implement organic waste collection system	Kenneth Karlsson & Jessica Rytter	3, 7 & 11
LIP3	Collecting Plastic	Moss	Extend plastic delivery to other types at recycling stations	Marit S. Asklien	8 & 13
LIP4	Environmental Vehicle	Moss	Collecting hazardous waste with an environmental car	Marit S. Asklien	8
LIP5	Plasterboard on landfill (discontinued)	Moss	Receiving plasterboard on separate place at landfill	Freddy Tangen	8 & 13

Ref. No.	Project Title	Partner	Brief Description	Lead Officer	Links to other LIPs
LIP6	Collecting EE waste at Schools	Moss	Collecting small EE waste – toys, batteries etc from schools	Tor Schmedling	1 & 7
LIP7	Waste minimisation in schools	Aaskov	Put in compost bins & organise education materials	Soren Prehnum	1, 2, 6, 9 & 11
LIP8	Task Force Waste	Aaskov	Networking of best Danish companies in waste management	Soren Prehnum	3, 4, 5, 10, 11, 12 & 14
LIP9	Re-Art One	Hamburg	An exhibition with pieces of art made of waste and recycling material	Jurgen Becker	1, 7 & 12
LIP10	PARS	Hamburg	Young people taught car dismantling and skills to enable them to get jobs	Jurgen Becker	4, 8 & 12
LIP11	Home Composting	Stockton	Promotion/Delivery of Home Composting across pilot areas with different socio-economic profiles.	Brian Simpson	2, 7 & 8
LIP12	Commercial Waste as a resource	Stockton	Networking with SME's (waste and other) to facilitate local partnerships, identify and improve waste opportunities, deliver waste awareness training and identify business opportunities.	Pauline Wright	8, 9 & 10
LIP13	HWRF Improvements (CA site)	Stockton	Improve the existing facility in terms of segregation, public information and awareness	Brian Simpson	2, 3 & 5
LIP14	CIWM Waste Awareness Training	Stockton	Accredited CIWM Waste Awareness/Waste Management Training delivered to business and other groups by SBC qualified trainers.	Sue Barker Schneider	8 & 10
LIP15	Real Nappies Project	Stockton	Promotion of "Real Nappy" use.	Brian Simpson	-

The principal contributions made by each project to the various quantitative "Project Indicators" are illustrated as follows:

Project Indicators / LIP	1	2	3	4	6	7	8	9	10	11	12	13	14	15
Results Indicators														
Amount (%) of waste diverted from landfill measured against baseline		✓	✓	✓		✓	✓			✓		✓		✓
Amount of household waste diverted to composting		✓								✓		✓		
Higher % recycling rates measured against baseline as a result of local initiatives	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓		
Number of people employed in SMEs in waste sector measured against baseline							✓	✓	✓		✓		✓	✓
Awareness of Waste and Recycling Issues in target groups from start of project and measures against baseline	✓			✓	✓	✓		✓	✓	✓	✓		✓	✓
Impact Indicators														
Decrease in amount of waste going to landfill		✓	✓	✓		✓	✓			✓		✓		✓
% reduction in waste produced measured against baseline and set against national trends.	✓					✓			✓	✓	(✓)*		(✓)*	✓

** Relate primarily to Commercial and Industrial waste*

Detailed reports are available describing the objectives, methods, results and conclusions of each Local Implementation Project. These are briefly summarised below:

4.8.1 LIP1 – School Education Programme (Falköping)

This project comprises an educational programme for school pupils, to raise awareness about waste reuse and recycling issues and reduce waste going to landfill and incineration. The target group comprised 100 pupils, aged 14-15, from Fredrikbergs School in Falköping. The project was linked to the 'Green Flag / Eco-School' concept (see www.greencity.dk) and to the Young Persons Network, and involved four steps:

1. Classroom activities to raise awareness;
2. Visit to, and practical experiments at Dalenium Science Centre;
3. Detailed life cycle studies of various products, presented to other pupils;

4. Bus tour of local waste management companies to view recycling of sawdust, glass, paper, plastics and metal.

In addition, a bottle top collection competition was run, and an 'environmental jamboree' took place, focused on waste issues.

Overall, the project is considered very successful (quantitative measures still to be determined), and could be extended to other schools in Falköping and beyond. The engagement and support of teachers is vital. The project is substantially complete, but will hopefully be continued after the Interreg project has ended.

4.8.2 LIP2 – Organic Waste Collection Systems for Flats (Falköping)

This project comprises the implementation of organic waste collection systems in small residential blocks of flats and training of the residents in their use. The systems involve residents sorting organic waste into paper bags (8 litre) and placing in a communal container outside each block of flats. Training and advice was provided to residents, and it has proved feasible to achieve reliable segregation of organic waste, suitable for subsequent treatment by 'digestion'. It was concluded that financial incentives to encourage better householder participation would be desirable.

4.8.3 LIP3 – Collecting Plastic (Moss)

This project comprised the establishment of arrangements to collect larger quantities and different types of plastic (film, cans, bottles, etc) from a selection of waste recycling points throughout the municipality. The waste is collected in transparent plastic bags and, over a period of eight months from December, more than 19 tonnes of plastics have been collected. The trial is considered very successful and the arrangements are to be extended throughout the municipality. It was initially anticipated that the plastic would be taken for recycling by 'Plastretur', an established Norwegian 'Return Company' who were already collecting and recycling source-separated plastics direct from households in the district. However, they were not prepared to take materials collected from recycling points/centres because of concerns about trade and commercial plastic waste producers using the facilities. Contracts have therefore been set up with other plastics recycling companies (including Ragn-Sells AS from Sweden).

4.8.4 LIP4 – Environmental Vehicle (Moss)

This project involves the establishment of mobile collection facilities for hazardous waste such as paint, batteries, garden chemicals, etc. Collection has been undertaken using manned vehicles (2 utility vehicles and a trailer) which visited well publicised locations, both urban and rural, on one evening each month for seven months. The vehicle team provided advice on and assistance with waste disposal. Almost 5 tonnes of waste was collected (approx 700kg per evening) and users were surveyed by questionnaire.

Overall, the service is considered to be very successful and it is hoped that it will continue after the Interreg project is complete. During the period of LIP4, the amount of waste collected at the local hazardous waste recycling point also increased significantly, which may well be due to awareness raising resulting from publicity about the Environmental Vehicle. During the period of operation, 21% more hazardous waste was collected in the municipality compared to the equivalent period in the previous year, with 20% of the increase being collected by the Environmental Vehicle.

4.8.5 LIP5 – Plasterboard on Landfill (discontinued) (Moss)

This project was to involve the collection of waste plasterboard, but required exemption from Landfill Tax to be viable. Such an exemption could not be obtained and the project was discontinued.

4.8.6 LIP6 – Collecting EE Waste at Schools (Moss)

LIP6 involved four primary schools and one secondary school, in a project to inform teachers and pupils about electrical and electronic waste, and to facilitate collection of small EE waste items. The 'Ella' environmental vehicle (mobile classroom on a lorry) visited schools in the Moss area to raise awareness and collect EE waste, whilst waste containers were supplied to the five schools to permit segregated collection of :

- Electronic items
- White Goods
- Small batteries
- Low energy lightbulbs.

The smallest primary school, Skarmyra Skole with 188 pupils, collected the most, 120kg, of EE waste.

Although the quantities of collected waste are less than hoped for, it is evident that both teachers and pupils are now much more aware of waste recycling and the environmental impacts of waste disposal.

4.8.7 LIP7 – Waste Minimisation in Schools (Aaskov)

This project comprised a programme of education about waste issues in schools, again linked to the 'Green Flag / Eco-Schools' initiative (see LIP1). Three schools in Aaskov were involved, linked through one teacher in each school. Questionnaires were issued to both pupils and their parents to establish attitudes to waste issues, and this survey will be repeated in due course. The project involved preparation of a range of resources and initiatives, linked to the science curriculum, with the objectives of reducing paper consumption, and collecting paper and organic waste for recycling.

4.8.8 LIP8 – Task Force Waste (Aaskov)

LIP8 involved the creation of a network and Forum of organisations involved in Waste Management, including private companies, public authorities and research institutes. The group is called Task Force Waste and is linked to the Green City Denmark initiative.

Members of the group have formed the basis of the Local Technical Forums, and have contributed to the Education and Waste Education Centre Forums,

Employment and Business Opportunities have been promoted through the group's involvement in the Dan Miljø trade fair, hosting trade delegations from Japan and China, and participation in a trade visit to Vietnam.

4.8.9 LIP9 – Re-Art One (Hamburg)

Re-Art One is an exhibition of artworks made from waste and recycling materials, linked to a series of Workshops for school students. The main exhibition took place initially over a period of ten weeks ending in September 2004, in a former recycling works at Ihlienworth in Cuxhaven, Lower Saxony in Hamburg, showcasing the work of 41 artists and craftspeople from 12 nations. Over 4,000 paying visitors attended and the event received widespread publicity.

The exhibition reopened in August 2005 to provide the base for educational workshops about waste issues, for primary and secondary school pupils. Over 500 students have participated, including groups from Stockton and Aaskov as part of the Young Persons Network.

The exhibition was chosen as the German contribution to World Environment Day 2005 in June in San Francisco, and has been designated as a UNESCO 'World Decade for Sustainable Education 2005/2006" project.

4.8.10 LIP10 – PARS (Hamburg)

PARS – Projekt AutoRűckbau in der Schule (Car Dismantling at School) is an ambitious project providing vocational training to 'problem' young people with 'special educational needs'. A car disassembly plant has been established, in association with a school in Hamburg, with start of the art tools and machines, in collaboration with BMW and Ford. Up to 46 youths work for a year in a programme which trains them in all aspects of vehicle disassembly, achieving a remarkable recycling rate of 95%. Numerous external partner organisations have been linked with the scheme.

The project is widely acknowledged as having a very beneficial impact on disadvantaged students, for whom this style of vocational training is ideally suited.

Unfortunately, due to rising world steel prices, there is a local shortage of scrap vehicles for recycling, as many are now exported to Eastern Europe, Africa and Asia. The PARS concept may be modified to provide training and experience in a wider range of recycling skills beyond vehicle dismantling. To be more viable, a more effective system of exchange or sale of recycled vehicle components and materials needs to be established.

The End of Life Vehicles (ELV) Directive requires a 95 recycling rate by 2015. PARS is already delivering such performance.

4.8.11 LIP11 – Home Composting (Stockton)

The Home Composting initiative in Stockton was run in collaboration with the UK Waste Resources Action Programme (WRAP) and is aimed at reducing the quantity of waste for collection and subsequent treatment by incineration or landfill. The project has examined alternative ways of promoting the sale of the subsidised composters in different socio-economic areas, via adverts, leaflets, one-day sales etc.

More than 8,000 composters have been sold, including more than 1,500 in a single day-sale in 2004, and it is conservatively estimated that this has reduced waste collected in the Borough by more than 200 tonnes per year.

It has been highlighted that home composting does not contribute towards the measure of waste diversion away from landfill (because the waste is no longer collected). In conjunction with WRAP, the data from Stockton will be used to justify amended definition of the landfill diversion measure.

4.8.12 LIP12 – Commercial Waste as a Resource (Stockton)

This project has aimed to persuade local small businesses in Stockton to reduce their waste or make better use of it, to improve their prosperity. The work included waste audits and visits to companies, development of a waste website, www.wastees.org.uk, and networking via the LTFs.

Waste audits were carried out at 15 companies. Together with participation in the LTFs, this has raised awareness of waste issues and best practice, although the direct impacts on business viability or employment cannot be determined.

The establishment of the 'Wastees' website is a tangible output which will continue to be maintained after completion of the MWW project.

4.8.13 LIP13 – HWRF Improvements (Stockton)

Improvements to the Household Waste Recycling Facility (HWRF) for Stockton / Middlesbrough has been achieved by improving waste segregation, increased signage, improving the range and quality of information at the site and by providing facilities for the better separation and storage of recyclable materials. The changes, drawing on best practice at facilities in Moss and Falköping, has involved new signage, waste containers, the construction of a storage building, employment of extra staff (funded by WRAP) and green waste collection / compost exchange. Two community recycling enterprises were established to collect and refurbish reusable furniture, and a contract was established to collect used IT equipment for refurbishment. Bicycles will be collected in future.

4.8.14 LIP14 – CIWM Waste Awareness Training (Stockton)

In collaboration with the Chartered Institution of Wastes Management, a Waste Awareness certificate (WAC), training programme has been established to deliver training courses to employees of a wide range of businesses who handle and manage waste. Stockton Council staff were themselves trained to deliver these courses. Stockton is now an official WAC Training Centre. The direct impacts on waste awareness and employment cannot be measured, but there has been a continuing interest in the courses, and the scheme, now financed by the course fees, will continue.

4.8.15 LIP15 – Real Nappies Project (Stockton)

Disposable nappies can constitute a significant proportion of a household's waste (eight million are thrown away every day in the UK, totalling 400,000 T per year!). Stockton Council supported the local Real Nappy Group in its campaign to encourage parents to choose reusable fabric nappies instead, by a combination of publicity and information, and the provision of subsidised real nappy 'kits'. A partnership with a local hospital Trust has been facilitated. It is estimated that waste reduction of 12,000kg per year has been achieved in Stockton as a result.

5 Project Outcomes

The outcomes of the project are summarised below, relative to the three 'key areas' identified at the outset. Each element of the project has contributed to one or more of the key areas as follows:

Key Areas / Outputs & Activities	Waste Management Systems					Employment & Business Opportunities	Public Motivation & Awareness
	Minimisation	Reuse	Recycling	Composting	Energy from Waste		
Local Implementation Projects:							
LIP 1	✓	✓	✓				✓
LIP 2				✓			✓
LIP 3			✓				
LIP 4			✓				✓
LIP 6		✓	✓				✓
LIP 7	✓		✓				✓
LIP 8						✓	
LIP 9							✓
LIP 10		✓	✓			✓	
LIP 11	✓			✓			✓
LIP 12		✓	✓			✓	
LIP 13		✓	✓				✓
LIP 14						✓	✓
LIP 15	✓						✓
Waste Education Centres						✓	✓
Young Peoples Networks							✓
Local Technical Forums			✓			✓	✓

5.1 Waste Management Systems

There were originally four LIPs focused on the waste management theme, but because of landfill tax issues, the one that was to examine the problems associated with disposal of plasterboard by landfill could not be concluded.

In Falköping a system was developed for collecting and composting organic waste from blocks of flats. A key part of the project is to involve the residents to make sure that the right material is collected and contamination is avoided.

In Moss there was a need to extend the collection of plastics from the recycling stations. An early problem with this project was to find an outlet for the plastic being collected. This was resolved through discussions at a project meeting and a Swedish company is now involved.

In Stockton the Household Waste Recycling Facility needed improvements to increase the separation of waste and increase the amount of material being recycled. This was done through improved signage and additional investment in a furniture and household items recovery unit.

Most of the other LIPs also contributed to a greater or lesser extent, towards the various aspects of waste management systems, from minimisation to composting.

Data was collected for 2005 (2004 for Hamburg) to allow a comparison to be made of waste management practices in the five municipalities relative to the 2002 baseline position. The results are summarised in Table 5.1 and Figures 5.1 to 5.5, below, and are used to examine performance in relation to the 'indicators' set at the beginning of the project, in Tables 6.3 and 6.4.

The 'average' values quoted are the arithmetic mean of the five municipalities' results, not weighted relative to population, otherwise Hamburg's data would unhelpfully dominate the outcomes.

The most significant change in waste management practice over the period is in Falköping where construction and operation of an Energy from Waste plant, together with changes in legislation has almost eliminated landfill (0.5%). It should be noted that, although Falköping experienced a large percentage growth (4.5% pa) in total waste arisings between 2002 and 2005, it still has by far the lowest waste arisings per person of all the five partner municipalities.

A detailed appraisal of the data reveals various discrepancies between 2002 and 2005, mostly relating to measurement of waste streams in 2005 which were not included in 2002. This is a cause of part of the apparent overall increase in waste collected over the period.

It has proved difficult to relate the changes to national trends in the five countries, but a comparison of total national waste arisings (kg/person) between 2002 and 2004 is also provided on Table 5.1 (source: Eurostat).

Table 5.1 – Waste Management Performance

kg/pers	Stockton		Hamburg		Falköping		Aaskov		Moss		Average	
	2002	2005	2002	2004	2002	2005	2002	2005	2002	2005	2002	2004/05
Amount of Waste Produced	516	488	421	407	292	333	564	550	425	501	443.6	455.8
Amount Landfilled	39.2	44.5	0	0	128.8	1.5	42.3	39.5	32.4	80.8	48.55	33.26
Amount Incinerated	403.8	363.8	315.5	316.5	61.7	200.2	283.8	253	267.1	285.8	266.37	283.88
Amount Composted	13.0	17.0	5.5	5.1	6.5	34.1	95.9	129.2	45.5	37.8	33.3	44.6
Amount Recycled	60.0	62.7	100.0	85.4	95.0	97.2	142.0	128.3	80.0	96.6	95.4	94.0
Diverted from Landfill	476.8	443.5	421	407	163.2	331.5	521.7	510.5	392.6	420.2	395.1	422.5
% Diverted from Landfill	92.4%	90.9%	100.0%	100.0%	55.9%	99.5%	92.5%	92.8%	92.4%	83.9%	86.6%	93.4%
% Landfilled	7.6%	9.1%	0.0%	0.0%	44.1%	0.5%	7.5%	7.2%	7.6%	16.1%	13.4%	6.6%
% recycled	11.6%	12.8%	23.8%	21.0%	32.5%	29.2%	25.2%	23.3%	18.8%	19.3%	22.4%	21.1%
TARGET 10% more diverted = 10% less landfilled		< 6.8%		< 0.0%		< 39.7%		< 6.8%		< 6.9%		< 12.0%
ACHIEVED		9.1%		0.0%		0.5%		7.2%		16.1%		6.6%
TARGET 10% more composted		> 14		> 6		> 7		> 105		> 50		> 37
ACHIEVED		17		5		34		129		38		45
TARGET 10% more recycled		> 12.8%		> 26.1%		> 35.8%		> 27.7%		> 20.7%		> 24.6%
ACHIEVED		12.8%		21.0%		29.2%		23.3%		19.3%		21.1%
TARGET 10% reduction amount landfilled		< 35.28		< 0.027		< 115.92		< 38.07		< 29.16		< 43.69
ACHIEVED		44.5		0.0		1.5		39.5		80.8		33.26
TARGET 5% reduction amount produced		< 490		< 400		< 277		< 536		< 404		< 421
ACHIEVED		488		407		333		550		501		455.8
Average Annual change %	-1.84%		-1.68%		4.48%		-0.83%		5.64%		0.91%	

National Trends kg/person	UK		Germany		Sweden		Denmark		Norway		Average	
	2002	2004	2002	2004	2002	2004	2002	2004	2002	2004	2002	2004
Amount of Waste Produced	600	600	640	600	468	464	665	696	677	724	610	617
Average Annual Change %	+0.00%		-3.18%		-0.43%		+2.3%		+3.4%		+0.57%	

Figure 5.1 – Total Waste collected

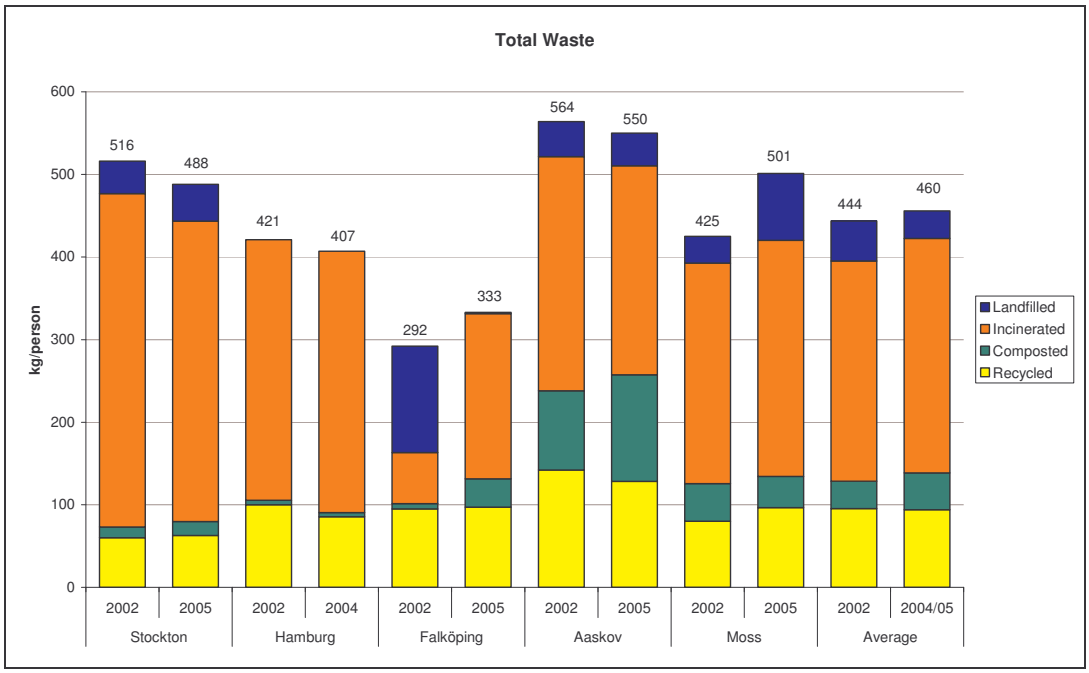


Figure 5.2 – Waste to Landfill

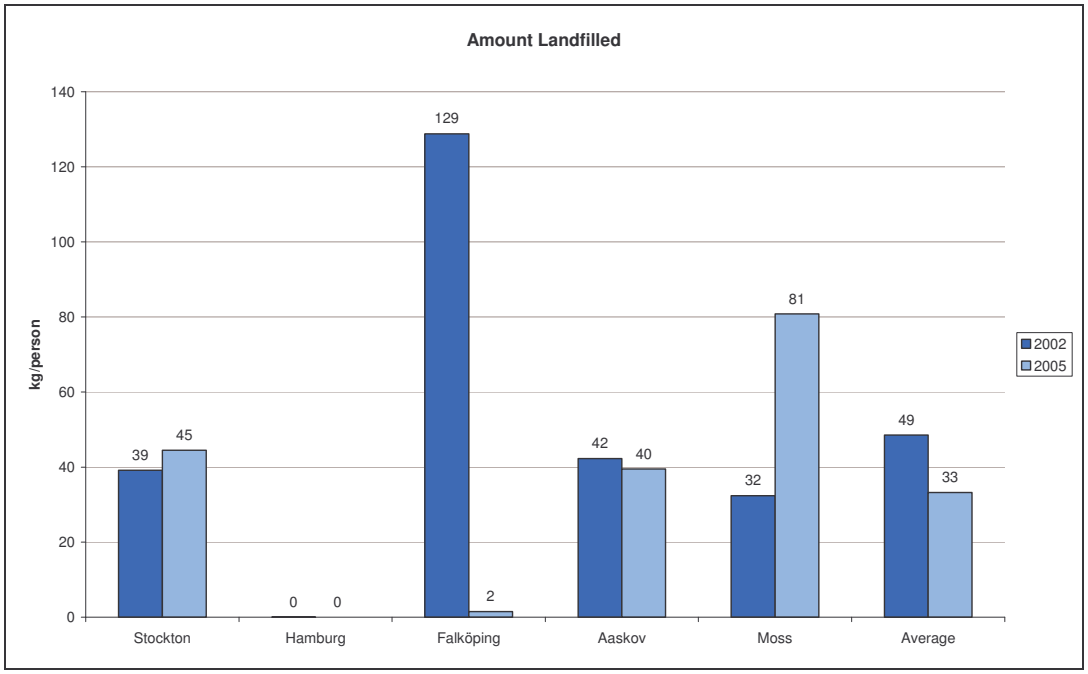


Figure 5.3 – Waste to Energy Recovery

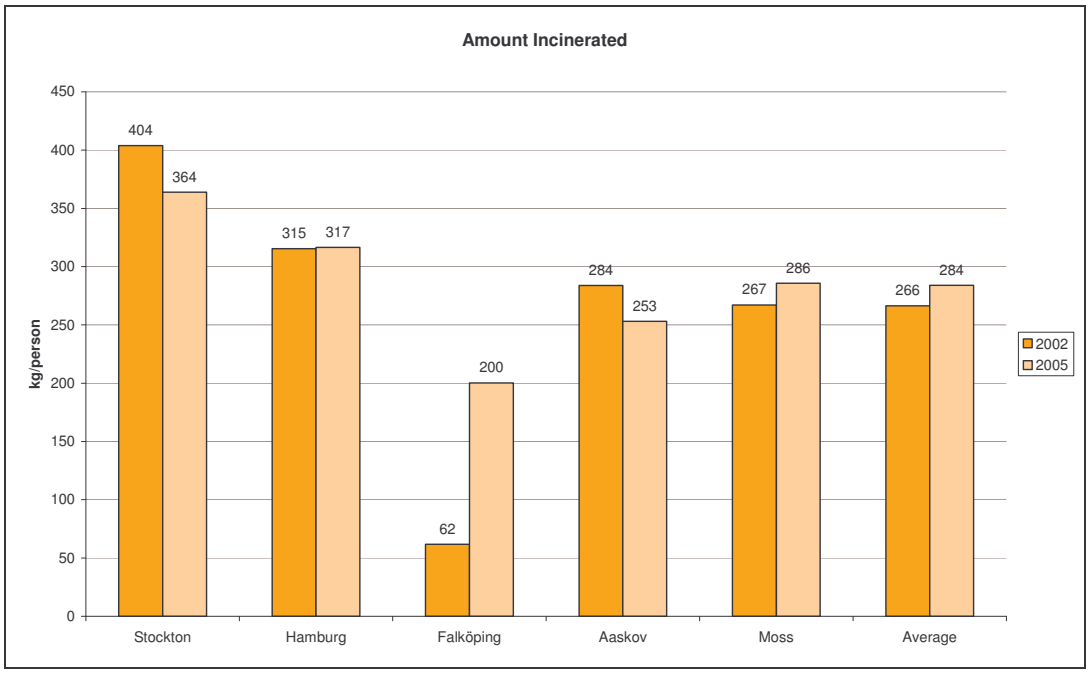


Figure 5.4 – Waste to Composting

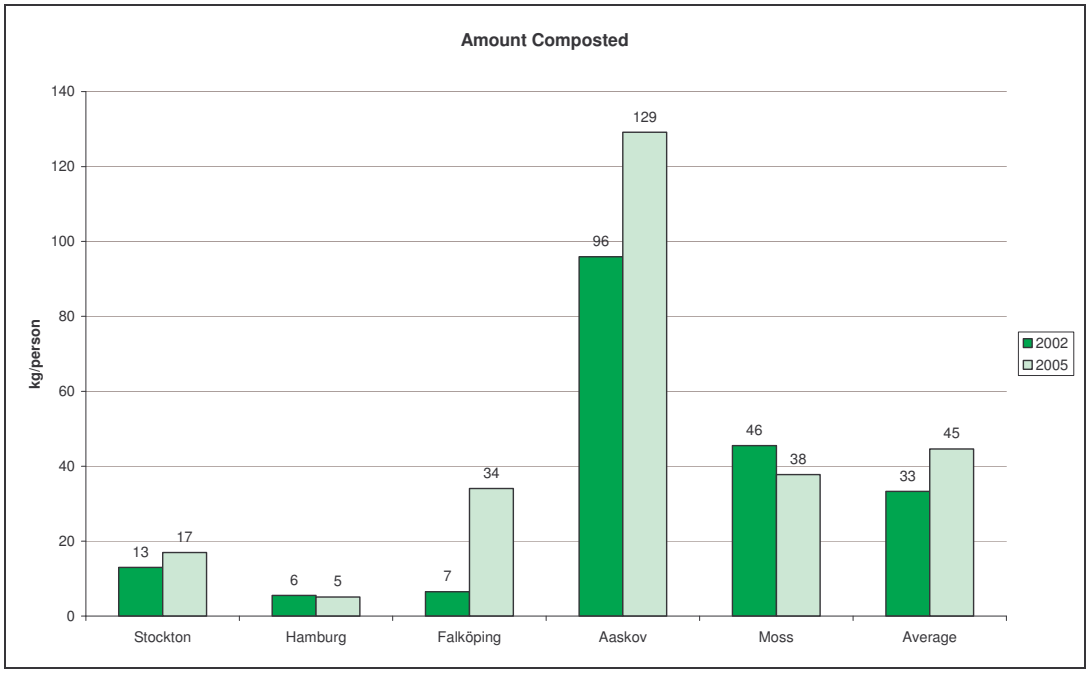
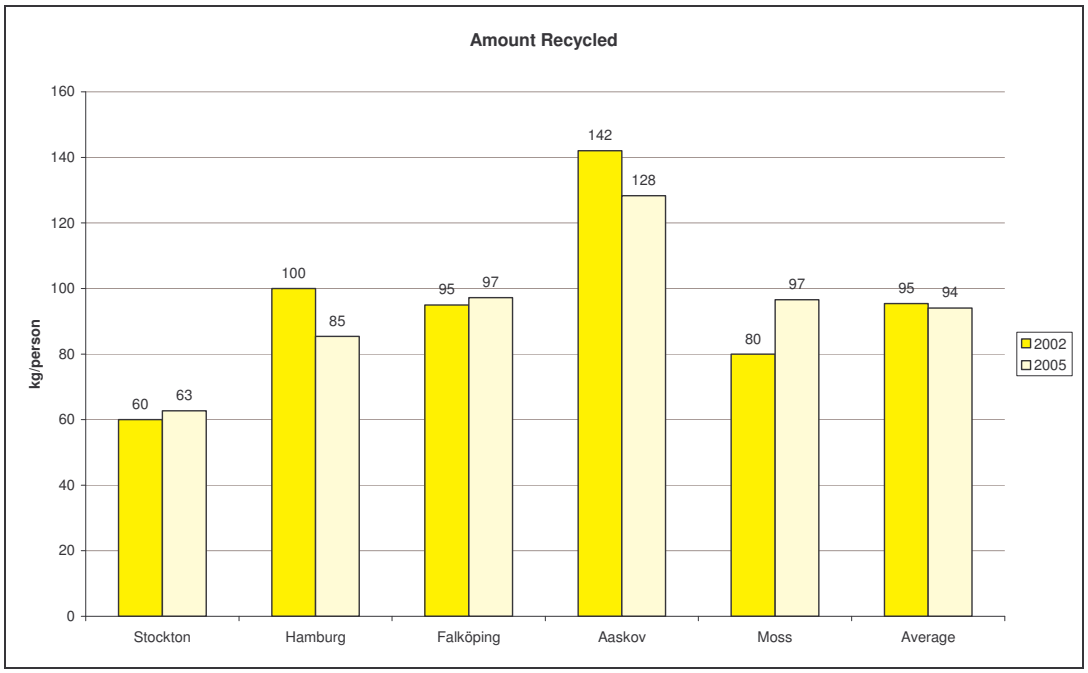


Figure 5.5 – Waste Recycled



5.2 Employment & Business Opportunities

Four LIPs are primarily linked to this theme, although any increased activity in the waste management sector or raised public awareness should lead to increases in employment within waste and recycling businesses.

Aaskov has teamed up with Green City Denmark to set up Task Force Waste which has set out to involve companies in developing new ideas and working through technical forums and trade events such as the Dan Miljø trade fair. Networking is a key part of this project, not just within Denmark but throughout the partner countries and even further afield.

Hamburg is supporting a project known as “PARS” which involves young people who have a low standard of education or behaviour problems in developing skills around the dismantling of scrap cars into their recyclable components. It is a mixture of training and education in the waste and recycling industry aimed at people who may not otherwise get such an opportunity. The project is developing links with other partners, particularly Stockton who are interested in developing similar ideas.

In Stockton, a project is developing which offers small businesses a waste audit to help them reduce waste and to see that the waste that they do produce is being re-used or recycled where possible. Early indications are that this is a service that small businesses value and helps them to become more efficient as well as increasing the amount of material being recycled which then helps those companies who are in the waste and recycling processing sector. In addition, in collaboration with CIWM, Stockton has developed and continue to deliver a Waste Awareness training package to local businesses.

A baseline survey to establish the numbers of people employed and of businesses active in the waste and recycling sector in the five municipalities was undertaken in 2002. Similar data has been sought in subsequent years, but it has been difficult to achieve consistency, and there are no clear trends yet emerging. The Making Waste Work project has not been running for long enough for a measurable impact to be established, and shorter term variations in economic activity mask any underlying trends. The available data indicates an apparent fall in numbers employed in the sector over the period of the project, by approx 9%. Most of the fall was in Hamburg due to increasing automation and mechanisation of recycling, and a small rise in unemployment between 2002 and 2004.

5.3 Public Motivation and Awareness

Ten LIPs fall under this heading although various have also been placed under waste management as a theme. In reality all projects need an element of public awareness if they are to be successful in motivating the community.

In Falköping a fun educational programme is being developed in the schools that aims to raise awareness amount young people. This has been linked with the Young Persons Network through which a visit has taken place by children from Stockton.

Moss have set up an 'Environmental Vehicle' which is collecting hazardous waste such as paint, batteries and oil from certain collection points. Householders are informed about these collection dates and locations through publicity leaflets and so far they have been very successful in collecting a lot of material.

Another project in Moss has been set up to collect electrical waste from schools. The project was launched with the help of a large mobile classroom – ELLA – that deals with waste and recycling issues in the community. It is a project designed to raise awareness in young people of the problems associated with electrical items such as old toys.

In Aaskov a project to encourage children to separate the waste into recyclable fractions has been set up. This has been linked to the Eco-Schools programme with three schools involved already.

In Hamburg art is being used as a means to highlight the use of waste material as a resource in a project called Re-Art One. An exhibition was held in Germany in summer 2004 with further exhibitions planned as well as workshops for children and networking opportunities for businesses.

A high profile publicity campaign to encourage householders to compost their green waste is being used in Stockton. The project will look at the impact on the waste stream of intensive home composting and the barriers that householders perceive which prevent them from participating.

Again, baseline surveys were completed in 2003/04 to establish public attitudes to waste and recycling, and these were repeated in 2005 to identify significant changes during the course of the projects. The surveys were generally completed by children in two age groups (primary and secondary school age) and by their parents.

It has proved difficult to establish a quantitative measure of 'awareness' of waste and recycling issues. Nevertheless, it is evident that the combination of national and regional waste campaigns, together with more local initiatives such as the LIPs, have led to greater awareness and to changed behaviour. School students are particularly receptive to these messages, and can influence the attitudes and practices of their families. The youngest (primary school age) children have been easiest to influence and motivate. A striking success has been evident in one of the schools in Aaskov, where work associated with LIP 7 led to an overall 18% reduction in waste generation.

6 Project Indicators

The extent to which the project has achieved or delivered on the various Project Indicators, defined at the outset, is summarised below:

6.1 Project Activities Indicators

Indicator	Baseline	Target	Activity / Location	Achievement		Comments
Number of organisations involved in the project	5	50				85 by Dec 2004
				223	✓	223 by Dec 2005
Number of people (directly) involved in the project	15	175				239 by Dec 2004
				568	✓	568 by Dec 2005
Number and nature of publications and press coverage	0	35				70 by Dec 2004
				117	✓	117 by Dec 2005
Networks established as part of the project	1	6	• Young Persons Network	1		See section 4.7 for details
			• Local Technical Forums	5		See section 4.5 for details
			Total	6	✓	
Cross Sectoral character of project participants	2	5		5	✓	Private Sector e.g. SITA Public Sector e.g. municipalities Environmental Sector e.g. Renew Tees Valley Educational Sector e.g. schools Voluntary Sector e.g. FRADE

Indicator	Baseline	Target	Activity / Location	Achievement		Comments
Number of meetings of the partnership	0	7	Steering Group Meetings	8	✓	See section 4.2 for details.
Number of exchange and information events	1	15 (3 per country)	Local Technical Forums			See section 4.5 for details.
			• Stockton	6		
			• Hamburg	3		
			• Falköping	5		
			• Aaskov	4		
			• Moss	3		
			Total	21	✓	In addition, many other events give an overall total of >100
Number of jointly developed local waste management initiatives	0	10 (2 per country)	• Stockton	6	✓	LIP11 Home Composting LIP12 Commercial Waste LIP13 HWRF Improvements LIP15 Real Nappies Project
			• Hamburg	1	✓	LIP10 PARS
			• Falköping	2	✓	LIP2 Organic waste from flats.
			• Aaskov	1	✓	LIP7 Waste minimisation in schools LIP3 Collecting plastic waste
			• Moss	3	✓	LIP4 Environmental vehicle LIP6 Collecting EE waste at schools
			Total	13	✓	

Indicator	Baseline	Target	Activity / Location	Achievement		Comments
Number of public information campaigns	0	10 (2 per country)	• Stockton	4	✓	Specifically the 'Wastees' website, and those associated with LIPS
			• Hamburg	2	✓	
			• Falköping	1	✓	
			• Aaskov	1	✓	
			• Moss	2	✓	
			Total	8	✓	

Key

✓ Fully achieved

✓ Partially achieved

✗ Not achieved / No evidence

6.2 Output Indicators

Indicator	Baseline	Target	Activity / Location	Achievement		Comments
Number of strategies for sustainable management of resources	0	3				At draft stage as at end of April 2006.
Baselines from key project areas/subjects established	0	4		3	✓	One baseline per project theme was developed – Target set of '4' may be an error
Best practice examples corresponding to baseline areas established	0	4			✓	Summary of LIPs and Best Practice Guide published June 2006.
Project website established	0	1	See www.waste.tec-hh.net	1	✓	
Number of small infrastructure projects as part of local waste management initiatives completed	0	5	• Stockton • Hamburg • Falköping • Aaskov • Moss Total	2 1 1 1 3 8	✓	LIP 11 Home Composting LIP 13 HWRF Improvements LIP 10 PARS LIP 2 Organic waste from Flats LIP 7 Waste minimisation in schools LIP 3 Collecting plastic LIP 4 Environmental vehicle LIP 6 Collecting EE waste at schools

Indicator	Baseline	Target	Activity / Location	Achievement		Comments
Waste Education Facilities Centre pilot achieved	0	1	• Stockton and Aaskov		✓	Schemes developed for Education Centres, and Business Plans prepared, but funding not yet agreed.
			• Hamburg		✓	Education resources (waste suitcases) prepared for use in schools, and signage improved at recycling centres.
			• Falköping		✓	Mobile exhibition about waste established at Dalenium, and now touring other venues. Signage improved at recycling centres.
Young Persons (information) Network established	0	1		1	✓	

Key

✓ Fully achieved

✓ Partially achieved

✗ Not achieved / No evidence

6.3 Result Indicators

Indicator	Baseline	Target	Activity / Location	Achievement		Comments	Refer Notes
Amount (%) of waste diverted from landfill measured against baseline (10% increase redefined as decrease in amount (%) of waste not diverted from landfill, i.e. 13.4% to be reduced to 12%)	92.4%	10% increase	• Stockton	90.9%	✗	LIPs 11, 13 & 15 contribute	S1
	100%		• Hamburg	100%	-	LIP2 contributes	
	55.9%		• Falköping	99.5%	✓	LIPs 7 & 8 contribute	F1, F3
	92.5%		• Aaskov	92.8%	✓	LIPs 3 & 4 contribute	
	92.4%		• Moss	83.9%	✗		M1
	86.6%	88.0%	Average	93.4%	✓		
Amount (kg/person) of household waste diverted to composting	13	10% increase	• Stockton	17	✓	LIPs 11 & 13 contribute	S2
	5		• Hamburg	5	✗		
	6		• Falköping	34	✓	LIP2 contributes.	F2
	96		• Aaskov	129	✓		
	45		• Moss	38	✗		M2
	33.3	36.6%	Average	44.6	✓		
Higher recycling % rates measured against baseline as a result of local initiatives	11.6%	10% increase	• Stockton	12.8%	✓	LIP11, 12 & 13 contribute	S3
	23.8%		• Hamburg	21.0%	✗	LIP10 contributes	H1-H19
	32.5%		• Falköping	29.2%	✗	LIPs 1 & 2 contribute	
	25.2%		• Aaskov	23.3%	✗	LIPs 7 & 8 contribute	A1
	18.8%		• Moss	19.3%	✓	LIPs 3, 4 & 6 contribute	M3
	22.4%	24.6%	Average	21.1%	✗		

Indicator	Baseline	Target	Activity / Location	Achievement		Comments	Refer Notes
Number of people employed in SME's in waste sector measured against baseline	400	5% increase	• Stockton	329	✗	LIPs 12 & 14 contribute	
	3291		• Hamburg	2965	✗	LIP 10 contributes	
	107		• Falköping	139	?	Includes water and energy based jobs. Waste jobs probably unchanged.	
	0		• Aaskov	0	✗	LIP8 contributes	
	0		• Moss	0	✗		
	3798	3988	Total	3433	?	Data not reliable	
Awareness of Waste and Recycling Issues in target groups from start of project and measured against baseline		10% increase	• Stockton			LIPs 11, 12, 14 & 15 contributes	
			• Hamburg			LIP 9 contributes	
			• Falköping			LIPs 1 & 2 contribute	
			• Aaskov			LIP7 contributes	
			• Moss			LIPs 4 & 6 contribute	
			Average		✓	Clearly achieved, but quantitative evidence not available.	

Key

✓ Fully achieved

✓ Partially achieved

✗ Not achieved / No evidence

6.4 Impact Indicators

Indicator	Baseline	Target	Activity / Location	Achievement		Comments	Refer Notes
Decrease in amount of waste going to landfill (relative to trend in total volume of waste produced.) Environmental impact indicator.	7.6%	10% reduction	• Stockton	9.1%	✗	LIPs 11, 13 & 15 contribute	S1
	0.0%		• Hamburg	0.0%	-		
	44.2%		• Falköping	0.5%	✓	LIP2 contributes	F1, F3
	7.5%		• Aaskov	7.2%	✓	LIPs 7 & 8 contribute	
	7.6%		• Moss	16.1%	✗	LIPs 3 & 4 contribute	M1
	13.4%	12.0%	Average	6.6%	✓		
Project findings and recommendations incorporated in regional waste strategies	0	3				To be confirmed in final report	
Continuing cross sectoral and transnational networks	0	3				To be confirmed in final report	

Indicator	Baseline	Target	Activity / Location	Achievement		Comments	Refer Notes
% Reduction in waste produced (kg/person) measured against baseline and set against national trends	516	5% reduction	• Stockton	488	✓	LIPs 11, 12, 14 & 15 contribute	S4, S5
	421		• Hamburg	407	✓	LIP10 contributes	
	292		• Falköping	333	✗	LIP1 contributes	F4, F5
	564		• Aaskov	550	✓	LIP7 contributes	
	425		• Moss	501	✗		M4
	444	421	Average	456	✗		

Key

✓ Fully achieved

✓ Partially achieved

✗ Not achieved / No evidence

Notes

Stockton

S1. **Increase in landfill** - this is because the Energy From Waste Plant has not been working during some periods in 2005 which has meant that the waste has been sent to landfill instead

S2. **Increase in composting** - this is because the number of properties participating in green waste collections has been increased

S3. **Increase in recycling** - this is because of increased recycling activity including a wider range of materials being recycled at the Household Waste Centre and more Bring Recycling facilities being established. Also all households in Stockton Municipality now have access to a recycling collection service for glass, drinks cans and paper

S4. **Decrease in waste arisings** - there has been a slow down in the amount of waste generated. This is due in part to the large number of home composters which have now been distributed and sold in Stockton. It is estimated that each composter can divert 25kg of waste per year. Over 8000 of these have been distributed in the last 2 - 3 years. This does not include other composting activity i.e. composters purchased outside the Stockton scheme and compost heaps and use of home-made compost containers

S5. **Waste minimisation and recycling -** it would appear that the five municipalities are devoting more resources to recycling than waste reduction measures. Recycling activity does not reduce waste arisings!! All we are doing is providing more containers for the same waste/more waste. More resources need to be spent on waste reduction measures. A waste reduction toolkit is being produced by the Government Office North East (GONE) which is as a result of work funded by DEFRA. This will made available to partners via the GONE or DEFRA websites later this year

Hamburg

Recycling waste:

H1. **Glass**

In Germany glass is collected in three fractions, white glass, brown glass and green glass. In 2002 Hamburg inhabitants have collected 37200 t/a. This corresponds to a waste amount of 21,6 kg/a. All glass could be recycled.
In 2004 the glass waste was reduced by about 6400 t/a. That means per person 17,7 kg/a were collected whereof 16,1 kg/a could be recycled. The collecting system for glass is too complicated. In crowded districts in Hamburg there is not enough collecting space near their flats.

H2. **Paper/cardboard:**

In Hamburg you can give away your paper and cardboard at the recycling centres. The other possibility is to bring it to drop off stations, where several containers are offered. Often these containers are full so that the cardboard and paper lie along the street. Every week a street collecting system completes the paper and cardboard collection additionally.

Compared to 2002, in 2004, an extra 5199 t of paper/cardboard have been collected. From 98499 t/a of collected paper and cardboard, 96529 t/a could be recycled - that means 98 %. That indicates that 54,1 kg/a per person could be recycled in 2002 and, in 2004, 55,6 kg/a per person. That's an increase of 1,5 kg/a per person.

One of the reasons is the attractive offer of street collection, which the people like to use. It is also not too complicated to integrate one date of the street collection in the daily work.

H3. **Clothes and shoes:**

In Hamburg it is possible to give away old clothes and shoes at the recycling centres or they are collected at drop off stations/street collection. The amount of clothes and shoes in 2002 and 2004 remained unchanged at 3,000 t/a, although 10954 more inhabitants lived in Hamburg.

Because of the bad economic situation, citizens may keep their clothes or shoes for a longer time before giving them away for recycling or to a flea market.

H4. **Plastics**

40400 t/a of plastics were collected in 2002, of which 25000 t/a were recycled. In 2004m 8445 t less was collected. It was not possible to research data about possible recycling rates.

Plastics are collected in Germany with the “Green Dot/yellow sack collection”. Special companies sort the contents of the “yellow sack” out into recyclable fractions.

Many people don’t use the yellow sack for reasons of hygiene. The yellow sack is collected only every two weeks.
Others don’t know what happens with recyclable waste. So you find a lot of the plastic in the residual waste because only the plastics with a green dot could be disposed to the yellow sack. Plastics without green dot have to be disposed of as residual waste. Mixture with residual waste unfortunately occurs often (sometimes 40%).

H5. **Green Waste**

Green waste is collected in a bio-bin or there is the option to bring green waste directly to your own composting area. You can also bring the bio waste to recycling centres. A bio-bin is put up only in less crowded districts of Hamburg. In crowded districts the bio waste is collected with the residual waste.

In 2002, 9750 t/a green waste was collected, whilst in 2004, only 9325 t/a were collected, ie.425 t/a less. In 2002, 9457,5 t/a were composted, in 2004 8858,8 t/a. That means 5,2 kg/a per person in 2002 and 5,4 kg/a per person in 2004.
There is a fee for bio-bins. Maybe citizens try to save money by composting by themselves in their garden.

H6. **Metal without tin, cans etc.**

Metals were collected at recycling centres. In 2002 9000 t/a were collected and everything could be recycled. This corresponds to 5.2 kg/a per person. In 2004 9600 t/a could be collected. That means about 5,5 kg/a per person, ie, an increase of about 6.7 %.

H7. **Wood**

19600 t/a of wood were collected in 2002. 5000 t/a could be recycled and 14600 t/a got burned. In the year 2004, 4000t/a of wood were collected. BSU (Behörde für Stadtentwicklung und Umwelt) informed us that 100 % of the wood fraction was recycled. The biggest part is wood of furniture. This furniture was delivered to "Stilbruch". That's a storehouse/shop, where used furniture gets sold.

Less furniture got sold, because the citizens throw less furniture away.

The information of the BSU is that the bulky waste will be sorted because of the new landfill regulation in 2005.

H8. **Tyres**

Tyres weren't measured in 2002. In the year 2004 200 t/a were collected. That totals 18000 pieces. They come from private households and could be fully recycled. That means, per person, 0,1 kg/a.

H9. **Fluorescent tubes**

Fluorescent tubes were collected in 2002 16 t/a and in 2004 19t/a.

The reason for the rise could be that the population of Hamburg increased and that citizens were taught and aware about the risks of the contents of fluorescent tubes.

H10. **White goods: Washing machine, refrigerators etc.**

1906 t/a of white goods were collected in 2002. That means 1,1 kg/a per person. In 2004 2060 t/a were collected. That means 1,2 kg/a per person.

Higher awareness of recycling or higher consumption of white goods could be the reason.

H11. **Other electronic and electrical equipment**

1300 t/a of other electronic and electrical equipment were collected in 2002. That means per person 0,8 kg/a. In 2004 the amount increases to 4700 t/a. That means per person 2,7 kg/a.

In Germany, the "Elektronikschrottverordnung" started on 24 March 06. That means that citizens are not allowed to throw small electronic and electrical equipment into the residual waste bins. They have to bring them to the recycling centres or to bigger shops. The discussion of the "Elektronikschrottverordnung" started several years ago and people were informed over radio and television. So many citizens now opt to collect electronic goods separately.

Hazardous waste:

H12. **Small batteries**

Small batteries are collected in Hamburg at the recycling centres or in shops. In 2002 the amount was 140,5 t/a. That means per person 0,1 kg/a. In 2004, 204.7 t/a were collected. In spite of the increase of the inhabitants the amount per person is similar like in 2002.

A reason could be that more citizens use rechargeable batteries for example for walkmans, digital cameras, disc players etc.

H13. **Waste oil**

Waste oil has been collected in 2002, 27 t/a. In 2004, only 18t/a. Most of the waste oil is collected directly in car garages.

H14. The Pentachlorophenol (PCP) amount in 2004 is 1 t/a similar to 2002

H15. **Spray boxes (Aerosols)**

Spray boxes weren't measured in 2002. In the year 2004, 31 t/a have been collected.

H16. **Car batteries**

202 t/a of car batteries were collected in 2002 and 197 t/a in 2004. That means an amount per person of 0,1kg/a.

It is possible to deposit car batteries at shops, so that only a small proportion comes to the recycling centres.

H17. **Paint, glue and varnish waste**

325 t/a of paint, glue and varnish waste were collected in 2002 at the recycling centres. In 2004 it was only 191 t/a, so it reduced from 0,2kg/a to 0,1 kg/a per person.

Private households use up their paint, glue and varnish, so that they are allowed to deposit the empty container in the yellow sack (DSD, Duales System Deutschland)

H18. **Other hazardous waste**

In 2002, 1093 t/a of other hazardous waste were brought to the recycling centres. In 2004 it was 1163 t/a. That means an amount per person of 0.6 kg/a in 2002 and 2004 of 0.7 kg/a in 2004.

H19. Overall, the recycling system in Germany is too complicated. Collection is not by recyclable material but by the green dot system which covers only the packaging fraction of all recyclable fractions. Most of the citizens don't understand why food packaging made of paper with a green dot doesn't belong to the Green Dot yellow sack. It belongs to the paper/cardboard waste even though a Green Dot is printed on it.

On cigarette packaging for example is a Green Dot. Consumers assume that they can dispose of the packaging of the cigarettes, made out of paper, plastic, aluminium, as well as the cigarette end in the yellow sack. But this is not right. Paper belongs to the paper fraction and cigarettes belong to the residual waste.

Implementation of the Green Dot system has neither lead to a significant higher separation of fractions nor to a decrease of packaging waste.

In addition, people should know what happens to the collected recyclable materials.

Information about that is hard to find.

To avoid waste in the future, arrangements have to be discussed and regulated with DSD (Duales System Deutschland) and the packaging production companies so that the companies develop packaging which will be able to be composted. Packaging made out of one material, which can be recycled without high energy processes would be another option.

Falköping

F1. Falköping does not landfill combustible materials any more. From 2002, you were not allowed to do that and, from 2005, you are not allowed to landfill organic matter (unless you obtain an exemption to do so)

F2. The collection system for sorting organic waste at the households in villages and the city continued to be implemented during this time. NOTE that in the figure for waste diverted for composting, we have included the amount of waste that is sent to the “Digestion chamber” that produces methane gas.

F3. The material that was not landfilled was sent to incineration

F4. The total increase of waste includes:

- 4% of the increase is waste collected by garbage trucks. Since the number of customers is roughly the same, this amount has probably risen because we implemented sorting of organic waste at a number of restaurants (which by Swedish legislation is also categorised as municipal waste). This increase would be organic waste that is processed into methane gas. Previously this waste was handled as waste from industry and was therefore not included in the total waste flow.
- The collected amount of hazardous materials has also increased.

F5. In Sweden, there is a 1 % reduction of total waste produced, measured between 2002 and 2004.

Aaskov

A1. The national trends in Denmark indicate that the amount of waste from 2003 to 2004 did go up by 7%, but the recycling rate also improved by 17%. So, although we produce more waste, we actually recycle even more.

Moss

M1. **Increase in landfill –** All residual waste from the recycling station is now disposed of to landfill, whereas previously it was incinerated. One of the reasons for this is economic benefits. Increasing number of SME's in the district are using the recycling station (for Commercial/Industrial waste). Waste from these contains more residual waste.

M2. **Reduction in composting –** We use wood in our composting process of oil polluted soil. In 2005 we have not taken in oil polluted soil because of lack of area. Because the amount of green waste/garden waste has been constant but the total amount of waste has increased the % of composted waste is reduced.

M3. **Increase in recycling –** collected more fractions that are recyclable.

M4. **Increase in waste produced –** The fractions responsible for most of the increase are, hazardous waste (PCB, paint, glue and varnish waste), and recyclable fractions like plastics, glass and paper. The amount of residual waste from the recycling station has also increased by 100 %. Through our environmental vehicle, we have focused on the hazardous waste fraction and we believe this is the reason for the increase in hazardous waste. We also have increased focus on plastic waste through our LIP's , this may be the reasons for this increase. We have also started a new recycling station in the region. This is certainly one reason for increase in the waste amount. Maybe we have not produced more waste, but we have made it easier for people do deliver it and in our statistics this comes out as more waste produced. Since the definition of household waste was changed in 2004, we have no national trends for this period.

7 Summary and Conclusions

Following the award in May 2003 of funding under the INTERREG North Sea Programme IIIB, the municipalities of Stockton on Tees (England), Moss (Norway), Falköping (Sweden) and Aaskov (Denmark), in association with TuTech University of Hamburg, embarked on a joint project looking at practical strategies to achieve waste minimisation and effective waste management processes. The project is now substantially complete and Stockton Council, the Lead Partner, has asked Arup to undertake an evaluation to establish the extent to which the project objectives, defined at the outset, were achieved.

The principal objective was to jointly run local projects to explore and test new methods and approaches in three key areas:

- Waste management systems
- Employment & Business Opportunities
- Public Motivation & Awareness

Four types of 'indicators' were established, as measures of success, as follows:

- Project Activities
- Outputs
- Results
- Impacts

A detailed comparison of targets and achievements for each of the indicators is given in Sections 6.1 to 6.4, and is summarised below.

7.1 Project Activities

A detailed Project Plan, drafted to accompany the funding application, set down a series of tasks, programme, etc, describing how the project was to be carried out over a period of three years. A baseline study established the starting point for most of the quantitative indicators, supported by a useful comparison of the legislative position in each of the five partner countries. A Steering Group was formed and has met on eight occasions, and a project website was established to aid communications between the partners. A Young Persons Network was set up to facilitate communications about waste issues between students in schools in Stockton, Falköping, Moss and Aaskov, and exchange visits have taken place. Local discussion groups (Technical Forums), involving representatives from the public, private and voluntary sectors, have met and exchanged experiences, and a programme of fourteen Local Implementation Projects (LIPs) was planned, implemented and reported.

Overall, the project activities have been largely completed in accordance with the Project Plan and the programme, with a high level of enthusiasm and commitment by each of the project partners, under very effective leadership by Stockton Council.

Most of the Project Activities Indicators (see section 6.1) substantially exceeded their targets, eg. for numbers of organisations and people involved, networks established, meetings held, press publicity, etc.

7.2 Outputs

Various 'outputs' or deliverables were identified (see section 6.2) and have mostly been completed or, in some cases, are still being progressed. The project website (www.waste.tec-hh.net) and the Young Persons Network were established and continue to operate. Baseline positions were established for each of the three 'key areas' (setting a target of '4' was probably an error). Education and exhibition materials were prepared to form the basis of 'Waste Education Centres' in Hamburg and Falköping, whilst schemes for more ambitious building projects in Stockton and Aaskov have been developed, and await decisions on grant funding. Various innovative small waste infrastructure projects have been undertaken.

7.3 Results

The results indicators were all numerical targets, derived from the baseline surveys undertaken in 2002.

7.3.1 Waste Management Systems

There were three indicators that related to this 'key area', as follows:

- to increase the percentage of waste diverted from landfill;
- to increase the amount of waste which was composted;
- to increase the percentage of waste which was recycled.

On average across the five municipalities, the first two targets were achieved, but the recycling percentage fell slightly from 22.4% to 21.1%.

However, there were marked differences between the performances of the five municipalities.

The diversion of waste from landfill was particularly helped by the virtual elimination of landfill in Falköping due to the commissioning of their Energy from Waste (EfW) plant. In Stockton, the landfill amount rose due to periods in 2005 when their EfW plant was out of action whilst, in Moss, more waste was collected (albeit still well below the Norwegian national average) with much of the 'extra' going to landfill.

Composting rose markedly in Falköping and Aaskov, but fell in Moss and slightly in Hamburg.

Recycling increased most in Stockton (although from the lowest starting point), but fell back slightly in Hamburg, Falköping and Aaskov, ascribed to recycling 'fatigue' on the part of residents. About 100 kg/person of recycling on average may be a 'natural' limit on what can be readily achieved by reliance on kerbside segregation and Recycling Centres (bring sites).

7.3.2 Employment & Business Opportunities

It was hoped that encouragement to establish new waste/recycling businesses, in conjunction with support and advice to SMEs (small and medium enterprises) to enable them to reduce their waste management costs, would lead to an increase in employment levels in the waste sector. In practice, it proved very difficult to establish reliable comparative data during the short duration of the project. In addition, more significant factors, in particular an economic downturn in Germany, led to apparent reductions in waste sector employment particularly in Hamburg whose figures dominate the overall total. It is also recognised that increasing mechanisation and automation of recycling plants will lead to lower employment levels.

7.3.3 Public Motivation & Awareness

A major objective of the project was to raise the motivation of the public to minimise or recycle waste and to generally increase public awareness of waste issues. Various of the LIPs were targeted towards this objective, in conjunction with meetings, press publicity, etc. Two target groups were identified – children (in two age groups) and their parents.

Public awareness is again an indicator that is very difficult to measure. A questionnaire survey of the target groups in 2003/04 was repeated in 2005. However, it has proved difficult to establish a quantitative measure of improvement. Nevertheless, it is clearly evident that the various campaigns and LIPs have led to a marked increase in awareness of waste issues, particularly within schools.

7.4 Impacts

The impacts of the project should be rather more lasting and long term, beyond its completion in 2006. Quantitative targets related to reducing the amount of waste being landfilled (which was achieved overall, see section 7.3.1) and a reduction in the overall amount of municipal waste (kg/person) collected by each municipality, relative to national trends.

The latter was not achieved, with an average increase of 0.9% per annum (444 to 456 kg/person from 2002 to 2005) compared to a 0.6% per annum rise in the average (of the five countries) amount of waste collected, from 610 to 617 kg/person. It is significant that although waste generation appears to be rising in the five municipalities, their amounts are consistently below their respective national averages, suggesting that the project partners are, perhaps not surprisingly, rather more waste aware than other comparable authorities.

The other two impact indicators, the incorporation of the projects findings in regional waste strategies, and continuation of cross-sectoral and transnational networks, which formed as a result of the project, are both in progress without the need for ongoing EU funding.

7.5 Summary

In summary, the Making Waste Work project has been substantially completed on programme, in accordance with the original Project Plan. A wide variety of local projects have been completed and reported, Technical Forums have been formed and have met a number of times, and a Young Persons Network has facilitated exchange visits and other contacts by school students.

A range of project indicators were identified at the outset, and most of these targets have been met or exceeded. Those that were not achieved have nonetheless provided useful lessons and insights into the difficulties of delivering more sustainable waste management.

The project reports, Best Practice guide, websites and other deliverables should be of value to many other municipal authorities from the five partner countries, in the rest of Europe, and beyond.

The project partners should be commended for their commitment to delivery of a very worthwhile project, carried out in a spirit of cooperation and professionalism, under the very effective leadership of Stockton Council.

Appendix A

Contact Details

A1 Contact Details

A1.1 Project Partners

Stockton-on-Tees Borough Council
Service Stockton

Chris Hayward
chris.hayward@stockton.gov.uk

Sun Street, Thornaby,
Stockton on Tees
TS17 6HB, UK

Tel: +44 (0) 1642 527261
Fax: +44 (0) 1642 527303

Falköping Municipality

Lars Uhlin
lars.uhlin@falkoping.se

Town Hall, S-521 81
Falköping, Sweden

Tel: +46 515 851 19
Fax: +46 515 851 01

Moss Kommune

May Mollan
may.mollan@moss.kommune.no

Fleischersgt. 7
175, N-1501 Moss
Norway

Tel: +47 951 496 37
Fax: +47 692 430 31

TuTech Innovation GmbH
(TuTech),

Prof. Walter Leal
leal@tuhh.de

Harburger
Schlosstrasse 6 – 12,
D-21079 Hamburg
Germany

Tel: +49 40 766 29 63 41
Fax: +49 40 766 29 63 49

Aaskov Kommune

Søren Prehnum
sp@aaskov.dk

Solbakken 30, DK-6933
Kibæk, Denmark

Tel: +45 99 992387

A1.2 Project Coordination

Mike Chicken
Mike.Chicken@stockton.gov.uk

Stockton-on-Tees Borough Council,
Development and Regeneration Services,
The Environment Centre,
21 West Row,
Stockton-on-Tees
TS18 1BT, UK

Tel: +44 (0) 1642 52 8148
Fax: +44 (0) 1642 52 8147

Kirstine Då
Kirstine.Da@stockton.gov.uk,

Stockton-on-Tees Borough Council
Municipal Buildings,
Church Road,
Stockton on Tees,
TS18 1LE, UK

Tel: +44(0) 1642 52 7567