RESOURCE RECOVERY COMMITTEE

MINUTES

13 March 2008

(REF: COMMITTEES-7551)

A meeting of the Resource Recovery Committee was held at the EMRC Administration Office, 1st Floor, 226 Great Eastern Highway, BELMONT WA 6104 on **Thursday, 13 March 2008.** The meeting commenced at **5.09pm.**

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1 DECLARATION OF OPENING AND ANNOUNCEMENT OF VISITORS

The Chairman opened the meeting at 5.09pm and welcomed members, visitors and staff.

The Chairman welcomed Mr Kevin Poynton, CEO of Mindarie Regional Council (MRC), Mr Alex Sheridan, CEO of South East Metropolitan Regional Council (SEMRC) and Mr Stuart McAll, CEO of Southern Metropolitan Regional Council (SMRC) who would give presentations at item 6 of the agenda.

The Chairman also welcomed consultants Mr John King, Ms Megan Haines - Cardno BSD and Mr John Stevenson – Stevenson Consulting and introduced Ms Emma Joy, Executive Assistant to the CEO of EMRC.

2 ATTENDANCE, APOLOGIES AND LEAVE OF ABSENCE PREVIOUSLY APPROVED

Committee Members

Cr Tina Klein	EMRC Member	Town of Bassendean
Mr Ken Goldsworthy (Deputising for Mr Simon Stewert-Dawkins	Manager, Health & Environmental Services	Town of Bassendean
Cr Sylvan Albert	EMRC Member	City of Bayswater
Cr Glenys Godfrey	EMRC Member	City of Belmont
Cr David Sadler	EMRC Member	Shire of Kalamunda
Mr Jonathan Smith (Deputising for Mr Singh)	Manager Health Services	Shire of Kalamunda
Cr David Lavell	EMRC Member	Shire of Mundaring
Mr Adrian Dyson (Deputising for Mr Purdy)	Manager Health Services	Shire of Mundaring
Cr Charlie Zannino	EMRC Member	City of Swan
Mr Martyn Glover	Director Technical Services	City of Bayswater
Mr Ric Lutey	Acting Chief Executive Officer	City of Belmont
Mr Jim Coten	Executive Manager, Operational and Development Services	City of Swan
Mr Gavin Watters	Chief Executive Officer	EMRC

Apologies

Mr Simon Stewert-Dawkins	Director Operational Services	Town of Bassendean
Mr Mahesh Singh	Executive Manager, Engineering Services	Shire of Kalamunda
Mr Shane Purdy	Executive Manager, Infrastructure Services	Shire of Mundaring

Deputy Committee Members - Observers

Cr David Färdig	EMRC Member	City of Swan

EMRC Officers

Mr Stephen Fitzpatrick	Manager, Project Development
Mr Adam Johnson	Executive Manager, Waste Management Services
Mr Mick McCarthy	Executive Manager, Regional Services
Ms Mary-Ann Winnett	Agenda Minutes Officer (Minutes)
Ms Emma Joy	EA to the CEO

EMRC Apologies

Mr Peter Schneider	Executive Manager, Corporate Services

Consultants

Mr John King	Cardno BSD
Mr Megan Haines	Cardno BSD
Mr John Stevenson	Stevenson Consulting

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Visitors

Mr Kevin Poynton	Mindarie Regional Council
Mr Alex Sheridan	South East Metropolitan Regional Council
Mr Stuart McAll	Southern Metropolitan Regional Council

3 DISCLOSURE OF INTERESTS

Nil

4 ANNOUNCEMENT BY THE CHAIRMAN OR PERSON PRESIDING WITHOUT DISCUSSION

The Chairman advised that the official opening of the Hazelmere Timber Recycling Centre had been held on Wednesday 12 March 2008. The opening had been well attended, a great address had been given by the EMRC Chairman and many accolades had been received from the Laminex Group. Attendees had seen the first truck depart from the station to the Laminex Plant at Dardanup.

5 CONFIRMATION OF MINUTES OF PREVIOUS MEETINGS

5.1 MINUTES OF THE RESOURCE RECOVERY COMMITTEE MEETING HELD ON 7 FEBRUARY 2008

That the Minutes of the Resource Recovery Committee meeting held on 7 February 2008, which have been distributed, be confirmed.

RRC RESOLUTION(S)

MOVED CR KLEIN SECONDED CR ALBERT

THAT THE MINUTES OF THE RESOURCE RECOVERY COMMITTEE MEETING HELD ON 7 FEBRUARY 2008, WHICH HAVE BEEN DISTRIBUTED, BE CONFIRMED.

CARRIED UNANIMOUSLY

6 PRESENTATIONS

6.1 PRESENTATION ON MINDARIE REGIONAL COUNCIL'S (MRC'S) RESOURCE RECOVERY PROJECT BY KEVIN POYNTON, CEO OF MRC

Mr Kevin Poynton, CEO of MRC provided a presentation on the process undertaken by the MRC in choosing a Build Own Operate (BOO) contract and some of the lessons learned so far.

Mr Poynton advised that copies of the reports from their consultants, Sinclair Knight Merz (SKM) could be made available to EMRC Councillors if required. Mr Poynton provided the Committee with copies of his presentation with risk workshop notes from SKM appended.

In response to Cr Färdig's query on why some of the technologies considered initially by MRC had been eliminated, Mr Poynton replied that MRC considered a range of technologies from thermal to biological at the Expressions of Interest (EOI) stage, but at that time there had been a lot of nervousness at the Government level and in the community and whilst the biological options were seen as acceptable, there were a number of people who had had negative experiences in other countries with thermal technologies. As a result of this the MRC Council pared back its options and eliminated some of the thermal technologies after heavy debate.

Item 6.1 continued

The Manager Project Development referred to the long period between the EOI and tender stages and asked if MRC had been tempted to go back to the market again to see if there were any other tenderers available. Mr Poynton replied that during the preparation of the tender there had been a lot of dialogue with contractors who had expressed interest and this had led to the production of a tender terms sheet and tenderers had submitted their bids based on that. Mr Poynton advised that MRC had also been going through the process of purchasing the land for their resource recovery project at that stage so it was not viable to go back to the market until the purchase of the land had been finalised.

The CEO of EMRC asked if it would be worthwhile to look at the options again now to re-evaluate the differences between the BOO and D&C contract delivery methods and the operating costs involved. Mr Poynton replied that there was a lot more data available now as a number of operators were embarking on resource recovery projects so there was an opportunity to obtain a more quantitive analysis.

The Chairman thanked Mr Poynton for his presentation.

6.2 PRESENTATION ON SOUTH EAST METROPOLITAN REGIONAL COUNCIL'S (SEMRC'S) RESOURCE RECOVERY PROJECT BY ALEX SHERIDAN, CEO OF SEMRC

Mr Alex Sheridan, CEO of SEMRC provided a presentation on the progress of their Resource Recovery Project and the decision making process undertaken to proceed with a BOO type of contract.
Mr Sheridan distributed copies of his presentation to the Committee along with copies of the Executive Summary from SEMRC's consultants, Clifton Coney Group, and advised that he could also provide further information from their consultant's report if required.

In response to Cr Färdig's query on what control SEMRC had over the gate fee Mr Sheridan replied that it would be considered at the time of tender and the contractor would need to take into consideration construction maintenance costs and ongoing overhead costs. Mr Sheridan referred to the method used by MRC to control the gate fee by linking to KPI's and the CPI.

The Executive Manager Regional Services referred to a BOO contract delivery method and asked how they could get a contractor to change or update a chosen technology type if it was already on site and operating and why it could not be linked to a KPI. Mr Sheridan replied that the contractor would be running the show but the banks would monitor the operation. The EMRC CEO added that the BOO operator would probably make a commercial decision about updating their technology and the Cleanaway MRF was an example of this.

The Executive Manager Regional Services' asked if SEMRC could see ways to improve the operating efficiency of the facility what powers would they have to effect those changes. Mr Sheridan replied that a management committee at board type level would be set up with the asset provider.

In response to Mr Coten's query on whether SEMRC would have taken the same path if they had the same landfill capacity as MRC, Mr Sheridan replied that the world trip taken by MRC Councillors and staff to other resource recovery facilities had opened his eyes to the technologies available now and the decision on the type of RRP would not just be based on their landfill capacity but on technology issues and costs as well as environmental and social issues.

Cr Sadler referred to SEMRC's landfill life expectancy of approximately 5 – 7 years and asked if SEMRC was hoping to increase their recycling rate from the current rate of approximately 20% to 100%. Mr Sheridan replied that he did not expect it to increase to 100%, maybe 75% as some of the tonnage going to the facility would go to landfill.

Item 6.1 continued

In response to the Manager Project Development's query on where SEMRC's estimate of $80M-$100M capital funding to build the RRF had come from Mr Sheridan replied that the information was from MRC's tender of approximately 18 months ago.

In response to Mr Stevenson's request for a summary of a couple of the principal reasons that SEMRC selected a BOO type contract Mr Sheridan replied that he wasn't employed by the SEMRC at that time but his understanding was that one of the biggest issues was the costs involved and SEMRC felt it was a more economical way with less risk and they were more comfortable with banks monitoring the contractor's performance.

In response to Mr Glover's query on whether the risks and concerns about the composting process and marketing the product had been discussed at the EOI stage Mr Sheridan replied that not a lot of work had been undertaken at this point in time, although it had been mentioned in the feasibility study.

In relation to a query about heavy metals in the compost, Mr Poynton advised that MRC's contract made provision for the contractors to manage the compost quality and marketing and this would be sorted out between Custom Compost and the contractor. He did not believe there were any issues in developing markets. Mr McAll advised that SMRC produced a C2 grade of compost that was restricted to selective markets not the domestic market.

6.3 PRESENTATION ON SOUTHERN METROPOLITAN REGIONAL COUNCIL'S (SMRC'S) RESOURCE RECOVERY PROJECT BY STUART MCALL, CEO OF SMRC

Mr Stuart McAll, CEO of SMRC provided a presentation on the SMRC's Resource Recovery Project, detailing the decision making process and risk management process undertaken by the SMRC for a Design, Construct and Transfer project.

Mr McAll advised that having a business plan was the most important issue in managing the RRP and advised EMRC to put a business plan in place to track progress.

In response to Cr Färdig's query on whether other RRF's being built would reduce their market for compost, Mr McAll replied that it would have no effect as the market was big enough to accommodate them all.

In response to Cr Färdig's query on the type of land ownership SMRC had for their facility Mr McAll replied that SMRC had a ground lease for the RRRC. For the original contract for the MRF the building would have reverted to the SMRC at the end of the contract but this arrangement was terminated when the contractor went into receivership and from June 2005 the SMRC ran the facility.

In response to Cr Färdig's request for an explanation of how SMRC are being paid for carbon credits Mr McAll advised that the SMRC was holding a carbon credit forum on 19 March 2008 in conjunction with the Municipal Waste Advisory Committee (MWAC) at the City of South Perth and anyone interested was welcome to attend. The principle was that the SMRC had a verified emission reduction agreement with the Federal Government and emission reductions or carbon credits could be traded on the market.

The Manager Project Development asked if any of MRC's member Councils had a no loans policy and if so how it was dealt with. Mr McAll confirmed that it had been an issue and the SMRC resolved it by borrowing the money themselves and the member Councils paid an annual fee for the capital, pro rata on the population, which was not shown as a liability on their books. The member Councils needed to put a note of contingent liability on their books but it did not impact on their ability to obtain loans.

The Chairman thanked the Regional CEO'S for their presentations.

Mr Poynton, Mr Sheridan and Mr McAll departed Council Chambers at 6.50pm.

7 ANNOUNCEMENT OF CONFIDENTIAL MATTERS FOR WHICH THE MEETING MAY BE CLOSED TO THE PUBLIC

NOTE: Section 5.23(2) of the Local Government Act 1995, details a number of matters upon which Council may discuss and make decisions without members of the public being present. These matters include: matters affecting employees; personal affairs of any person; contractual matters; legal advice; commercial-in-confidence matters; security matters; among others.

7.1 EMRC PREFERRED RESOURCE RECOVERY FACILITY (RRF) OPTIONS PROGRESS REPORT

REFERENCE: COMMITTEES-7554

See Item 10.1 for details

8 BUSINESS NOT DEALT WITH FROM A PREVIOUS MEETING

Nil

9 REPORTS OF OFFICERS

9.1 ISWA/SARDINIA CONFERENCES

REFERENCE: COMMITTEES-7553

PURPOSE OF REPORT

To advise Council of the outcomes from attendance at the waste management conferences ISWA World Congress (Amsterdam), Sardinia Landfill Symposium (Italy) and visits to London Remade and resource recovery facilities in Europe.

KEY ISSUES AND RECOMMENDATION(S)

- EMRC Councillor Barry McKenna, TAC Chairman Ric Lutey and EMRC officers Adam Johnson and Steve Fitzpatrick attended the ISWA World Congress in Amsterdam during September, followed by the Sardinia Landfill Symposium in Italy during October. Visits were made to London Remade and various resource recovery facilities in Amsterdam. In addition, some of the group visited Compact Power in Bristol and Kompogas in Zurich.
- The standard of the papers at ISWA and Sardinia was high and much information was gained of relevance to the EMRC's existing landfill operations and the resource recovery project.
- The paper presented by Adam Johnson at the ISWA conference was well received.
- Useful contacts were made by officers at both conferences and from the facility visits, some of which have already been helpful to the resource recovery project.
- The information gained from the conferences and the visits was very worthwhile and will assist the next phase of the Resource Recovery Project.

Recommendation(s)

That:

1. The report be received.
2. Relevant information from the conferences and visits be utilised in the Resource Recovery Project.
3. EMRC write to London Remade thanking them for their time and exploring possible avenues for further information exchange.
4. EMRC write to Compact Power and Kompogas thanking them for hosting the recent visits and requesting more information on capital and operating costs to assist our resource recovery evaluations.

SOURCE OF REPORT

Manager Project Development

BACKGROUND

The 12 July 2007 meeting of the RRC considered a report item on proposed attendance at the International Solid Waste Association (ISWA) World Congress in Amsterdam, the Sardinia Landfill Symposium in Italy and visits to London Remade and the Wuppertal Institute for Climate, Environment and Energy. At the ordinary meeting of Council on 26 July 2007, it was resolved:

- *"THAT A TECHNICAL ADVISORY COMMITTEE MEMBER COUNCIL OFFICER ATTEND THE INTERNATIONAL SOLID WASTE ASSOCIATION WORLD CONGRESS IN AMSTERDAM, THE ELEVENTH INTERNATIONAL WASTE MANAGEMENT AND LANDFILL SYMPOSIUM IN SARDINIA, AND VISIT LONDON REMADE AND THE WUPPERTAL INSTITUTE FOR CLIMATE, ENVIRONMENT AND ENERGY IN SEPTEMBER AND OCTOBER OF 2007.*

Item 9.1 continued

- *THAT THE RESOURCE RECOVERY COMMITTEE CHAIRMAN OR NOMINATED DEPUTY, ATTEND THE INTERNATIONAL SOLID WASTE ASSOCIATION WORLD CONGRESS IN AMSTERDAM, THE ELEVENTH INTERNATIONAL WASTE MANAGEMENT AND LANDFILL SYMPOSIUM IN SARDINIA, AND VISIT LONDON REMADE AND THE WUPPERTAL INSTITUTE FOR CLIMATE, ENVIRONMENT AND ENERGY IN SEPTEMBER AND OCTOBER OF 2007.*
- *THAT THE MANAGER PROJECT DEVELOPMENT, EMRC, ATTEND THE INTERNATIONAL SOLID WASTE ASSOCIATION WORLD CONGRESS IN AMSTERDAM, THE ELEVENTH INTERNATIONAL WASTE MANAGEMENT AND LANDFILL SYMPOSIUM IN SARDINIA, AND VISIT LONDON REMADE AND THE WUPPERTAL INSTITUTE FOR CLIMATE, ENVIRONMENT AND ENERGY IN SEPTEMBER AND OCTOBER OF 2007.*
- *THAT THE ACTING EXECUTIVE MANAGER, WASTE MANAGEMENT SERVICES, EMRC, ATTEND THE INTERNATIONAL SOLID WASTE ASSOCIATION WORLD CONGRESS IN AMSTERDAM, THE ELEVENTH INTERNATIONAL WASTE MANAGEMENT AND LANDFILL SYMPOSIUM IN SARDINIA, AND VISIT LONDON REMADE AND THE WUPPERTAL INSTITUTE FOR CLIMATE, ENVIRONMENT AND ENERGY IN SEPTEMBER AND OCTOBER OF 2007."*

This report item was included in the agenda for the Resource Recovery Committee meeting on 29 November 2007 but Councillors felt there was insufficient time to consider the report and it was deferred to the next meeting of the RRC. On 13 December 2007, Council resolved:

> *"THAT THE REPORT ITEM 9.2 ISWA/SARDINIA CONFERENCES BE DEFERRED TO THE 7 FEBRUARY 2008 MEETING OF THE RESOURCE RECOVERY COMMITTEE."*

At the 7 February 2008 meeting of the RRC, the report item was again deferred and on 22 February 2008, Council resolved:

> *"THAT ITEM 6.2 PRESENTATION ON ATTENDANCE AT THE 2007 ISWA AND SARDINIA CONFERENCES, VISITS TO LONDON REMADE AND RESOURCE RECOVERY FACILITIES BE DEFERRED TO THE NEXT RRC MEETING."*

REPORT

EMRC participants (Cr Barry McKenna, Ric Lutey, Adam Johnson and Steve Fitzpatrick) attended the ISWA World Congress in Amsterdam and the Sardinia Landfill Symposium in Italy during September and early October 2007. The Manager Engineering/Waste Management presented a paper at the ISWA conference entitled "The development and application of waste management law domestically and internationally", which was well received.

Whilst in London, the tour group visited London Remade as planned and also travelled to Bristol to visit the Compact Power facility (pyrolysis/gasification of clinical waste). At the ISWA Congress, the tour group joined technical tours of several waste management facilities including incineration plants, landfills, transfer stations, sorting and processing of waste, collection and recycling park and refrigerator dismantling and recycling. Between attending the ISWA Congress and the Sardinia Symposium, most of the group visited Kompogas anaerobic digestion facilities in Zurich, Switzerland. Officers were unable to organise a visit to the Wuppertal Institute for Climate, Environment and Energy as originally planned.

Details of the various visits and the two conferences are shown in Attachment 1. Key points from the two conferences and the visits are:

- The visit to London Remade was very informative and it will be worth maintaining a link with them to learn more about their business methods for possible application in the eastern region and for possible information exchange.

Item 9.1 continued

- The Compact Power facility at Bristol was worth visiting to meet the management and understand how the technology operated and its stage of development. Pyrolysis/gasification technologies are a very active area of technology development and could play a part in resource recovery in the eastern region for specific waste streams. The ability to fully utilise the waste heat from the process could be an issue in siting such a facility.
- The Kompogas facilities inspected in Zurich, Switzerland were very impressive examples of proven anaerobic digestion technology making quality compost/fertiliser products and green power. Evergreen Energy is the Australian agent for Kompogas who organised this visit and we are in contact with them to confirm details of the technology.
- Technical tours as part of the ISWA Congress were not quite as beneficial as the separately organised visits however participants did see large scale waste incinerators in operation and get to understand the reasons why these facilities work in a European context. Cr McKenna was able to see Extended Producer Responsibility in action at a business recycling refrigerators.
- Papers presented at the two conferences were generally relevant to the EMRC's business and there was merit in sending four participants because of the ability to cover a number of streams at both conferences, particularly the Sardinia Landfill Symposium (8 streams) and the increased opportunity to network with other delegates, presenters and industry people.
- Adam Johnson's presentation on "The Development of Waste Management Law" at ISWA was well received.
- Climate change and the impact on current and future directions in the waste sector was a significant focus of the two conferences.
- There is a case for a global initiative on the management of hazardous waste and excluding it from landfill because of the very real effects on human health in developing countries.
- Likewise the use of non-theraputic arsenic in poultry and swine production is a health concern and needs to be tracked to understand the fate of the arsenic.
- The EU regulations on landfill and member state policies/regulations on greenhouse gas emission reduction will continue to drive the investment in waste to energy technologies, anaerobic digestion and aerobic composting.
- There have been examples of the conversion of aerobic composting facilities to anaerobic digestion to reduce energy consumption and greenhouse impacts.
- Sustainable landfill will always have a role in the management of waste.
- There is a case for developed countries to help developing countries with capacity building in waste management provided it is cognisant of the social aspects of the local area.
- There is a lot of research being conducted on the environmental impacts of landfills and other waste management techniques. Some of this is relevant to the EMRC.
- Biohydrogen research is a very active area for a future hydrogen based economy if it can be shown to be sustainable.

<u>Conclusions</u>

- The site visits where we could inspect the plant/facility, get detailed explanations and easily ask questions were very useful and should be the focus of any future tour, although there would be a benefit in scheduling a tour around a conference with limited numbers attending.
- Attendance at international waste management conferences is very useful to provide context to our own situation, to learn first hand about the problems and successes in technology development and present papers on the EMRC's achievements.

Item 9.1 continued

- There are many reasons why countries/regions/cities adopt specific waste strategies. Some of these are geographic, environmental, philosophical, legislative, historic and economic and are either individual or in varying combinations. In the European Union, member states are regulated by the Landfill Directive and also very conscious of the climate change implications of waste management options.
- Where developed countries/regions/cities have adopted a particular waste treatment technology there has generally been a great deal of development of the technology to improve its operational efficiency, effectiveness, environmental impact and cost. This was illustrated by the numerous papers on landfill operation (liners, drainage materials, leachate management, gas recovery, post closure management, etc), incinerators (new technologies, gas emissions, combustion residues) mechanical/biological treatment methods, recycling and composting.
- There is no technical reason why properly engineered landfills can not continue to meet the waste disposal needs of many areas (including the EMRC) and landfill is a very appropriate "safety net" technology. There is an argument in some countries that the use of a well engineered and managed landfill will provide environmentally acceptable waste disposal at the least cost giving the opportunity to divert funds to address other climate/sustainability/environmental issues.
- Professor Michael Braungart was an inspirational speaker at the ISWA Congress and challenged the thoughts of all present. He made the point that efficiency doesn't necessarily make sense but effectiveness does; sustainability is a bare minimum; you don't protect when you just destroy a little less; total reuse/recycling is the only efficient use of materials - there is no waste, just use. He advocated that through transformation of human industry to ecologically intelligent design, commerce and nature can fruitfully co-exist.
- Setting random goals for waste reduction or reduction of waste to landfill can be a disincentive. There needs to be a realistic and agreed plan and timeframe with sufficient resources available.
- Stakeholder involvement is essential.
- Anthropological climate change is a reality; however, landfill is only a very small contributor. The major contributors are deforestation, rice cultivation and animal husbandry.
- Bio-fuel crops may divert agricultural production away from foods for the poor and starving at great social risk.

The Executive Manager Waste Management Services is preparing a separate report item for the February 2008 meeting of the Technical Advisory Committee (TAC) and/or RRC on the ISWA/Sardinia conference papers relating specifically to landfill and any implications for the EMRC.

STRATEGIC/POLICY IMPLICATIONS

Waste management and resource recovery are key ongoing and future strategies identified in the EMRC Strategic Plan.

FINANCIAL IMPLICATIONS

The budget for this international conference attendance was estimated at $75,000 to be funded from the cost centre - Undertake Resource Recovery Project Study Tour. The 2007/08 budget for this cost centre is $111,000.

SUSTAINABILITY IMPLICATIONS

These conferences focus on sustainable waste management practices, which the EMRC endeavours to apply to its current and future operations.

Item 9.1 continued

MEMBER COUNCIL IMPLICATIONS

Member Council	Implication Details
Town of Bassendean	Nil
City of Bayswater	
City of Belmont	
Shire of Kalamunda	
Shire of Mundaring	
City of Swan	

ATTACHMENT(S)

1. Details of Facility Visits and ISWA, Sardinia Landfill Conferences (Ref: Committees-7555)
2. London Remade, Annual Report 2005/6 (Ref: Committees-7556)
3. Compact Power, Renewable Energy Solutions (Ref: Committees-7557)
4. The Kompogas Process (Ref: Committees-7558)

VOTING REQUIREMENT

Simple Majority

RECOMMENDATION(S)

That:

1. The report be received.
2. Relevant information from the conferences and visits be utilised in the Resource Recovery Project.
3. EMRC officers write to London Remade thanking them for their time and exploring possible avenues for further information exchange.
4. EMRC officers write to Compact Power and Kompogas thanking them for hosting the recent visits and requesting more information on capital and operating costs to assist our resource recovery evaluations.

Discussion ensued

Cr Klein noted that there seemed to be some very good Waste Management Facilities in operation in Holland.

Cr Klein also referred to Sandra Cointreau's presentation at the ISWA World Congress and the problems facing solid waste management in developing countries such as Nigeria and felt there should be a global initiative to assist these countries and wondered how that could be achieved. The Manager Project Development advised that Sandra Cointreau's point was that there should be a global initiative and he felt sure that Ms Cointreau would pursue that in her role with the world bank. He also advised that Ms Cointreau would be a keynote speaker at this year's Waste and Recycle Conference.

Cr Klein felt that the delegation to the ISWA/Sardinia Conferences had gained some valuable information.

The Committee noted that at the last Ordinary Meeting of Council held on 21 February 2008 Councillors requested to see the presentation on attendance at the 2007 ISWA and Sardinia Conferences and felt that this report item and the presentation should be deferred to the next Ordinary Meeting of Council being held on 20 March 2008.

Item 9.1 continued

RRC RECOMENDATION(S)

MOVED CR KLEIN SECONDED MR GOLDSWORTHY

That Item 9.1 ISWA/Sardinia Conferences be deferred to the next Ordinary Meeting of Council to be held on 20 March 2008 and be considered along with the Presentation on Attendance at the 2007 ISWA and Sardinia Conferences.

CARRIED UNANIMOUSLY

COUNCIL RESOLUTION(S)

MOVED CR ZANNINO SECONDED CR KLEIN

THAT:

1. THE REPORT BE RECEIVED.
2. RELEVANT INFORMATION FROM THE CONFERENCES AND VISITS BE UTILISED IN THE RESOURCE RECOVERY PROJECT.
3. EMRC OFFICERS WRITE TO LONDON REMADE THANKING THEM FOR THEIR TIME AND EXPLORING POSSIBLE AVENUES FOR FURTHER INFORMATION EXCHANGE.
4. EMRC OFFICERS WRITE TO COMPACT POWER AND KOMPOGAS THANKING THEM FOR HOSTING THE RECENT VISITS AND REQUESTING MORE INFORMATION ON CAPITAL AND OPERATING COSTS TO ASSIST OUR RESOURCE RECOVERY EVALUATIONS.

CARRIED UNANIMOUSLY

Details of Facility Visits and ISWA, Sardinia Landfill Conferences

1. London Remade

We met with Jamie Blake, Director of Operations and Ellen Struthers, Programme Manager. London Remade is a private sector, not for profit organization heavily funded by the London Development Authority. Located in central London they are in the business of recycling and creating environmental solutions for a sustainable capital. They achieve this through developing markets for recycled content products, providing tailored support to help grow green enterprises and introducing green practices to existing businesses. They act as a leading business advisor and consultant to London boroughs to improve their recycling and waste management services. Their ultimate aim is to transform London's waste into a reusable resource, to create viable everyday products and reduce the impact on landfill.

Some of their services include:

- Green procurement
- Growing green enterprises (Leave No Footprint program) and support for new entrants to London's recycling, reuse and remanufacturing industries;
- Boosting recycling and diversion targets; and
- Building recycling infrastructure – bringing together private investors and opportunities in the waste sector – they have a good knowledge of the waste flows and the local authorities.

Since 2001, London Remade have grown to 40 employees, they have created over 800 jobs in the recycling sector, facilitated the installation of over 2 million tonnes reprocessing capacity, helped to divert over 760,000 tonnes waste from landfill, greened 193 businesses and helped create 38 new products (refer Attachment 2).

The EMRC will explore ways to continue information exchange with London Remade, which could include a staff exchange programme.

2. Compact Power, Bristol, England

The EMRC group (with the exception of Cr McKenna) travelled to Bristol on 21 September to meet with Richard Hogg, Business Development Director of Compact Power. Mr Hogg gave a presentation on the history of the technology development and then a tour of the facility at Avonmouth, which has been operating for 7 years processing clinical waste with a gate fee of between £150 and £600/tonne. The process involves pyrolysis of the waste followed by gasification and then heat recovery and power generation (1.8 MW). The heat recovery and power generation involves steam production for a steam turbine. Waste steam is used in another part of the process to sterilise waste before landfill disposal.

The process has been tested using refuse derived fuel, unsorted MSW, sewerage sludge, industrial waste, tyres and paper. The Avonmouth plant is 15,000 tonnes per annum (tpa) capacity and a new 30,000 tpa facility is to be constructed alongside, expandable to 60,000 tpa which will take municipal waste from the City of Bristol.

The advantage of the Compact Power process is that it is very compact (a 60 metre by 30 metre building can house a 60,000 tpa plant), it easily achieves the EU emission targets without any gas cleaning, it has low visual impact compared to an incinerator, it is highly automated and can be run by one operator (refer Attachment 3).

In relation to the Resource Recovery Project, this is a commercialised technology which warrants further investigation as to its potential application to some part of the EMRC waste stream. Further information will be gathered from Compact Power especially operating and capital costs and performance on various waste streams, to determine whether to include them in an Expressions of Interest process.

3. Kompogas, Zurich, Switzerland

After attending the ISWA Congress, part of the EMRC group travelled to Zurich where we were hosted by Mr Peter Knecht, Manager for International Licences of Kompogas whom we met at ISWA. Also present were Tony Kanak and Fritz Surber of Evergreen Energy (the Australian agents for the technology). Mr Knecht showed us two of the Kompogas plants, the first a 10,000 tpa plant about 10 years old and the second a more recent 16,000 tpa plant.

Kompogas have numerous facilities in Europe and Asia ranging from 10,000 tpa to 100,000 tpa capacity. The technology is anaerobic digestion of biogenous waste (organic waste - such as vegetable and food waste, kitchen waste and left-overs plus green waste - such as grass, bark, mixed garden waste, leaves) to produce biogas, compost and a liquid organic fertiliser (refer Attachment 4). Kompogas purified the biogas and ran their vehicles on compressed gas plus they had the alternative to feed this into the gas main or to convert it to electrical power through generators. The compost and liquid fertiliser had certified organic status.

The technology was proven and relatively simple to operate, construction was low cost using concrete for the digester, there were no odour emissions detectable from the biofilters and the land requirement for the plant was modest (5,000 m^2 for a 20,000 tpa plant). Kompogas like to have at least a minority interest in all their facilities in Switzerland, for Australia this would be negotiable but more than likely they would want some equity and to be able to maintain technical support for the facility.

This technology will be considered for the EMRC Resource Recovery Project Expressions of Interest process, depending on the ownership model preferred by Council.

4. ISWA World Congress

The ISWA Congress in Amsterdam ran over four days from 24 to 27 September including a day of technical tours. The theme was “Challenging the Future” and the focus was on climate change and technical issues facing the waste industry. The Congress also celebrated 100 years of the Dutch solid waste organisation NVRD. There were 5 streams of concurrent papers, 95 papers presented plus poster papers, an exhibition, 7 technical tours and 600 delegates.

Keynote Presentations

Jacqueline Kramer, Dutch Minister for the Environment

The Netherlands Government has a programme “Clean and Green New Energy for Climate Change” which aims to reduce greenhouse gas emissions by 30% by 2020, produce 20% of energy from renewable sources and reduce energy consumption by 2%. This will be achieved by a combination of policy instruments – including a green tax system, temporary incentive schemes, stimulation of an emissions trading scheme and energy and climate change diplomacy.

The Government will be moving from a sector based approach to a full chain approach (cradle to cradle). The aim will be for 83% recovery from waste, 13% incineration, 3% landfill and 1% discharge.

Professor Michael Braungart, Director of McDonough Braungart Design Centre, Professor of Process Engineering Hamburg University.

This presentation was definitely one of the highlights of the conference. Professor Braungart is the author of *Cradle to Cradle* and feature on a recent SBS program "Waste equals Food". He spoke about:

- the philosophy of tolerance and rationality, progress and maturity, humanity and community building;
- the effects of bad design eg gases emitted from badly designed children's toys, that the packaging for toys was cleaner than the actual toys; terrorism was only designed to be chap;
- human population control questions which he compared to ants which have four times the biomass of humans which we don't query, a key difference being that ants don't make waste, everything they use is food;
- That because of disasters, there is a feeling that we are bad and we need to be less bad;
- That eco-efficiency doesn't always make sense as everything beautiful is un-efficient whereas eco-effectiveness does make sense, eg growing trees;
- Biological cycles for everything we consume and technical cycles (for toxic products from TV sets for example);
- When we incinerate paper and plastics we are losing nutrients;
- You don't protect when you destroy a little less;
- Rematerialisation – triple top line, examples of which were drawn from work Prof Braungart has been involved in eg Shaw Carpets sell floor packaging solutions, all recycled; Mirra Chairs can be disassembled; Trigema Biodegradable tee shirt –every component is compostable;
- Sustainability is a bare minimum, it is just standing still;
- Doesn't make sense to make biodiesel from corn, makes sense to use spent diapers to grow trees;
- Burning sewage sludge loses nutrients, need to capture oxides of nitrogen and convert them to nitrates for the soil;
- Waste to energy has a negative energy balance, need to ask can I compost it or can I burn it as a clean fuel; and
- Cradle to grave creates graveyards whereas cradle to cradle keeps materials in cycles.

Sandra Cointreau, Senior Solid Waste Management Advisor, World Bank

Ms Cointreau outlined some of the problems facing solid waste management in developing countries including:

- This year in developing countries, the urban population is equal to the rural population with half of the urban population living on less than $2 per day;
- Cities being ring fenced by industry and livestock production which is highly polluting;
- Most hazardous waste is not excluded from MSW;
- Nigeria has no landfills, people live on the dumps with as many as 10,000 people picking one site;
- Disease is being spread by birds;
- 75% of all emerging diseases in the past 10 years are from animals (SARS, avian influenza, mad cow disease, Ebola virus etc);
- World Bank is the main body funding avian influenza work;
- Excreta is a priority means of transmission for some livestock diseases;

- Non-theraputic use of arsenic in most poultry and swine production as an anti-microbial agent and to promote growth and where pink meat is wanted the arsenic dose is higher; the manure is then applied to the land and can be taken up by plants as arsenic metalloid. The concern is that no-one is tracking the fate of the arsenic;
- Governance in these countries is lacking, only 8% have shown improvement; bidding prices include corruption costs;
- The majority of the urban poor work in the informal sector which includes waste collection and recycling where women make up over 30% of the waste pickers and they take their children to work exposing them to lead and disease; and
- There should be a global initiative on the management of hazardous waste and a global ban on the non-theraputic use of arsenic in livestock production.

Specific Interest Papers

Peter Knecht, Kompogas

- Switzerland used to have a lot of incineration 30 years ago as the country is too small too have landfills;
- Introduced 3 R's and quantity based disposal fee which led to behaviour change;
- Kompogas technology first commercialised in 1992 in Zurich, plant still operating;
- First company in Switzerland to drive gas powered CO_2-neutral cars;
- Disadvantage of the composting process is that it uses energy (30 kWh/tonne);
- Kompogas process uses anaerobic fermentation of organic material to produce renewable energy in form of biogas (methane) and digestate. The biogas is used to produce electricity and heat in a combined heat and power plant. Some of the gas is used to fuel cars as compressed methane or it can be exported to the gas mains. The heat is available to third party users and a small amount is used to heat the fermenter;
- The digestate is dewatered in a press and the solid cake is aerobically matured to produce high quality compost. The liquid phase is sold as an organic fertiliser. Both products are organically certified;
- The better the quality of the input organics the better the output yield of biogas and quality of the digestate. Because of household source separation of organic waste in Switzerland, feed quality to the Kompogas process is very high; and
- Kompogas were involved in converting an aerobic composting plant at Passau, Germany to anaerobic digestion.

Suez Environmental's experience with Mechanical Biological Treatment (MBT) technology, Jean-Luc Martel.

- In Australia, Suez operate as SITA Environmental Solutions and they have an interest in the Port Stephens and Cairns composting plants (formerly Bedminster owned and operated) and will be operating the Mindarie Regional Council composting facility;
- In Germany MBT is used as a transitional treatment prior to incineration;
- National law in Germany imposes stringent conditions on construction and operation of MBT plants including emission limit values. For example, all exhaust air from composting and compost storage has to pass through a combination of biofilters, acid washing and then a regenerative thermal oxidation unit to reduce odours and volatile organic compounds;
- The Crobern, Germany plant processes 300,000 tpa of residual refuse and industrial waste in tunnel composters, the fine stabilised fraction from which is landfilled. The coarse and high calorific fractions are incinerated; and
- In Newcastle, UK, Suez operate a MBT process to process 120,000 tpa of municipal waste, the coarse fraction from which is landfilled and the fine fraction is tunnel composted.

Biomass conversion, by Essent Milieu: Smart Composting; John van Haeff

- 3 million tonne organic waste produced annually in the Netherlands of which 1.5m tonnes is vegetable, garden, fruit and green waste. Essent Milieu process 25 % of this latter quantity;
- Their concept is to produce high quality compost and high quality biomass for thermal processing; and
- The amount of biomass incinerated is set to equal the energy used to process the compost, making the programme energy neutral.

More Energy from Waste, the Dutch way; Tim Gerlagh, SenterNovem

- Dutch government agency promoting sustainable innovation;
- Aim is 20% renewable energy in 2020 – including 50% more from incineration, decrease in landfill emissions, replacement of fossil fuels with biogenic fuels;
- Waste management policy of the last decades has led to an infrastructure of waste incinerators and will lead to a reduction of landfill to almost zero.;
- Incinerators provide renewable energy and a reduction in greenhouse gas emissions; and
- Still potential to improve heat production.

Waste to Energy as a contributor to the saving of resources; Jan Manders –Director of External Affairs AVR-Van Gansewinkel

- In Europe - 45% of waste landfilled, 37% recycled, 18% treated thermally;
- EU Landfill Directive is that member states must reduce the amount of biodegradable municipal waste to landfill to below 35% by 2016.
- This will reduce greenhouse gas emissions by 74 million tonnes CO2 equivalent.
- 420 Waste to Energy plants across Europe which provide 2% of the energy demand of the EU and 7 million households with power and 13 million households with heating (2005 data);
- If EU states switched from landfill to recycling (60%) and waste to energy (40%) would need another 60 to 93 million tonne of capacity per year and
- Some countries such as the UK, Ireland, Italy are behind in making the switch away from landfill.

Waste workers of the world: formal and informal; Laila Kamal, Director of CID, Community and Institutional Development in Egypt.

- Ms Kamal described the social issues of waste management in Egypt, the social architecture for waste management systems;
- There is a lot of poverty in the southern parts of Egypt, poor people will try to get to the waste before you;
- People prefer a door to door collection;
- Waste pooling sites as introduced by the northerners became a mess;
- People living off less than $1 a day start scavenging;
- Landfills were seen as the solution to waste management but this ignored the huge informal recycling sector;
- People had to start to pay for a collection service whereas before they had a free door to door service;
- Message is that you can't beat the poor, why not work with them. The poor did deals with the foremen and stole waste from transfer stations and trucks;

- After 4 years of international contractors being introduced to Cairo, the contractors ended up getting nothing, the government and the contractors are in dispute, some have left;
- Government has called for a rethink and is setting up schools for children of waste workers;
- Waste workers want help to improve their technology and they do this by meeting in their own communities and transferring their know-how;
- People source segregate into food and non-food, recyclers want non-food, composters want the food;
- Recyclers are community based and feed the product to large manufacturing firms;
- Solves employment problem, poverty, allows wast to flow to composting plants and claiming of carbon credits;
- Message was don't do the engineering construct – landfills, do the social construct – recycling;
- Hospital waste is a big problem – sold to informal sector poor and mixed with hospital kitchen waste. Hepatitis B and C a problem, beginning to immunise against these; and
- Household hazardous waste not dealt with, batteries going into food waste.

Conversion of Biomass residues to transportation fuels with the HTU process, Frans Goudriaan, Netherlands.

- This is a new process, called Hydro Thermal Upgrading (HTU) for converting biomass residues into a crude oil type of product which can be upgraded to premium diesel;
- Process is unique in that it can be applied to wet biomass;
- The extraction of protein from grass is also being looked at in conjunction with the HTU process; and
- A demonstration plant is planned for 2009.

Solid Waste Management in Ontario, Canada: Problems and Opportunities; Peter Steblin, City of London, Ontario

- 40% of Ontario's garbage is exported to the US;
- 2008 target of 60% diversion for the Province is unreachable;
- Cost and environmental benefits of reaching diversion target unknown;
- Waste management hierarchy pushes Energy from Waste and landfill to the bottom;
- Environmental approvals for landfill and technologies is long and costly;
- Current system not sustainable;
- City of London's response is long term planning to avoid waste management crisis, keep the public and Council informed, work in partnerships, balance solid waste services with other environmental needs, trying to achieve a balance of environment, fiscal and social responsibility; and
- The City of London recognises that is perhaps behind other countries in resource recovery but at the same time it sees a duty to help those behind Canada and has assisted Sri Lanka and Ghana to develop local solutions, partnerships and capacity building.

Technical Tours

AEB, Amsterdam

- We visited the AEB waste incineration facility in Amsterdam which is owned by the City of Amsterdam;
- Three incinerators on site, newest one is 800,000 tpa capacity, commissioned early 2007 ata cost of €400 million. Avoided CO2 emissions are 200 million tpa;
- 15 year payback on investment, current gate fee €70/tonne, long term contracts;
- 30% electrical performance;
- In 10 years time the whole city will be heated by the plant;
- 2% of the waste stream ends up in landfill;
- Recover non-ferrous metals from the bottom ash;
- Dutch scenario for 2012 is no landfill for combustible waste;
- Landfill rates are €20 - 30/tonne plus a landfill tax of €80/tonne giving a total price of €110/tonne;
- Incineration gate fees are between €50 and €150/tonne;
- Reuse and recycling is preferred but costs €30-€200/tonne; and
- Promoting source separation important – 3 bin system (paper, glass, residual).

Afvalzorg, Amsterdam

- This is an example of a sustainable landfill (15 years old), 200 hectare site, 7 million m3 landfilled, permitted to go to 9 million m3, waste height 10 m, between 3 million and 30 million m3 landfill space left;
- An award winning architect designed office building has been constructed which floats on the waste in a completed landfill cell;
- The office is heated and cooled by methane being extracted from the landfill;
- Office constructed of plantation timber, steel and concrete slab;
- No leachate recirculation (not permitted in the Netherlands), cells have a bottom liner and a top liner;
- 26 landfills in the Netherlands; and
- Gate fees are Euro 28-30/tonne for non-hazardous waste.

Netwerk and Coolrec, Dordrecht.

- Netwerk is a collection and recycling park; Coolrec dismantle and recycle refrigerators;
- The EU producer responsibility is a key to the recycling of large items like TV's and fridges as this provides the economics for the pick up and break down into parts;
- The volumes are large which drives the economics (suspect such a system would be un-economic in Perth);
- Coolrec are just at the point of making money from fridge dismantling and recycling (they receive 12 to 15 per fridge with the EPR up front levy and other subsidies) and so with the subsidy it will be a good business with the volumes they turn over; and
- Rotterdam has a card reader system for household waste/discards delivered to transfer stations. The card system records weight of item deposited, how many time the card has been used etc. This could have an application for rate paying properties in the region – a card could be used instead of tip passes. The card readers are on the bin and you can only open then up with a card. Mainly used in high density areas.

HVC and GP Groot, Alkamaar

- Four incinerator lines for household and commercial waste including one new state of the art incinerator.
- No emissions visible or found by monitoring from the three significant stacks
- Initial community opposition has gone, now widespread acceptance that the facility is a good neighbour.

5. Sardinia Landfill Symposium 2007

The eleventh edition of the Landfill Symposium was held at Forte Village, Pula in Sardinia from 1 to 5 October 2007, celebrating the 20th anniversary since the symposium began. The focus was on innovative aspects of waste management including new technologies, state of the art, controversial topics and sharing experiences among different countries. There were 8 concurrent streams, 576 papers, poster papers and a small exhibition, 1000 delegates and 80 countries represented.

Plenary Sessions

Harmut Grassl, Max Plank Institute of Meteorology, Hamburg; "Global anthropological climate change – How large is the landfill contribution?"

- Mr Grassl did not really answer this question; he spoke about climate change being driven by deforestation, fossil fuel use, animal husbandry and rice cultivation; of semi-arid areas becoming drier (10 to 40% less annual precipitation) and higher northern latitudes becoming wetter and of more weather extremes;
- Southern Germany is becoming drier and the spruce have started to die in the forests of central and southern Germany;
- Total energy use is growing faster than population driven by developing countries;
- The key challenge for humankind is dampening the anthropological climate change rate for sustainable development;
- Global warming will last between 800 and 1000 years;
- Precipitation changes – those who have plenty get more and vice versa;
- Greenland ice holds the equivalent of 7 metres of sea level rise;
- Small sea level rises affects the saltiness of fresh water on atomic atolls;
- What to do – limit mean global warming to 2oC which equates to 450 parts per million (ppm) atmospheric CO2; electricity consumption target of 500kWh/person/year; compliance with UN conventions;
- After 2040 direct solar electricity and solar hydrogen will be competitive, cola will disappear by 2010 (too costly);
- Need to internalise the external effects – at € 70/tonne of CO2 ($116/tonne), 1 kWh of coal fired power would be € 0.07 more expensive; and
- Spoke of emission rights – everyone has a right to emissions.

Waste Management in times of climate change, Prof. Stegmann, Germany

- Need to provide landfill storage for soil, sludges and demolition waste from storm and flooding disasters;
- Consider covering of waste storage and treatment facilities, intermediate storage of rainwater for use;
- Germany is aiming to reduce the impact of climate gases from landfill – between 1990 and 2003 there was an 18% reduction, aiming for a 28 million tonne reduction from the closing of landfills between 1990 and 2012;

- Aim for 2020 is 500 million tonne CO2 reduction by avoided landfill gas generation, energy utilisation, material recycling;
- Increasing trend of conversion of biowaste composting to anaerobic digestion;
- Main emission reductions to come from incineration (and more efficient incineration), waste to energy, co-incineration, paper and metals recycling;
- EU15 - target of 11% reduction from waste management by avoided landfill emissions and greater energy efficiency – to be achieved by waste avoidance (collection polluter pays principle, lower fuel consumption, minimum transport distances, for long travel distances use boat or train); alternative collection systems – collect on demand, pipe systems); landfills –landfill gas extraction mandatory, increase efficiency of energy use 50% of energy is heat which is not used, oxidation of methane by in –situ aeration at low extraction rates;
- Energy from Waste (EfW) – more thermal treatment with heat recovery, higher steam temperatures and pressures, central but also decentralised plants (near energy users);
- Anaerobic digestion – leakage control, coverage of storage;
- Composting - increased CO2 storage in soils, bring organic materials back to the soil, conflict of EfW with composting, developing countries have low energy prices and less energy requirement where they have tropical climate; and
- Challenges – waste avoidance, energy savings in waste collection and operation of plants; recycling – avoid/minimise toxic compounds, production of high quality compost, transformation from composting to anaerobic digestion.

Professor Cossu

- Spoke about sustainable landfill – reaching acceptable levels of stability within 30 years;
- Problems include liners that don't last forever, top cover degradation, drainage systems (10 years), geomembrane (10 years);
- Open dumping can have the same impacts as a dry tomb when the liner fails;
- When barrier comes to an end after 30 years, the impact is low because gasified carbon is reduced so you are only left with stable carbon as a "geological deposit"; and
- From 30% to 50% of the original carbon can be stored as a "geological" sink.

Biohydrogen Production Workshop

- This is an area of intense research because of the push towards a low carbon economy. Hydrogen as a fuel produces no carbon emissions but there are no environmental benefits unless it can be produced sustainably;
- Four papers were presented by researchers from Italy, Germany and Japan. The session was facilitated by Associate Professor Bill Clarke from University of Queensland who is also involved in this research work;
- The research work covered hydrogen production from fermentation of organic waste. The processes include bi-photolysis (uses water and green algae), photo fermentation of sugars and dark fermentation (no light required);
- Other wastes being tested include piggery waste, organic fraction of MSW, olive mill wastewater, compost, agricultural waste, grass species and tree species;
- The presentations focussed on the yields from the various research work compared to the theoretical yields;

The Disaster of the Goettingen-Diederode MBP/MBT Plant, Wolfgang Stachowitz.

- This presentation was about a disaster that occurred at the Goettingen-Diederode mechanical biological waste pre-treatment plant (MBP/MBT) plant in January 2006 when large parts of the plant were destroyed, the damage bill was approximately 10 million Euros; and
- The investigation excluded an explosion of biogas or a fire as the cause and the presenter would not reveal the actual cause. He mentioned that the fermenters had been constructed from screwed enamel plate and when rebuilt they were welded plate. Failure of the screwed enamel joints could have been the cause of the collapse of the fermenters and subsequent damage.

On the Road to Zero Waste, Joseph Garbarino.

- An interesting presentation by the Garbarino family on their business in California, Marin Sanitary Service;
- California mandated 50% waste recycling by 2000. It is currently approaching 80%; and
- 90 to 95% participation rate with a split bin system.

Four Years of Experience with Woodlawn Bioreactor, Stephen Hancock, URS.

- URS confirmed our belief that there was no intention to mine the lower levels of the Woodlawn "bioreactor" landfill site because they will become saturated with liquid; and
- Hydrogen sulphide generation and release is a major issue for them because of acid mine drainage sulphates being reduced to sulphides.

Landfill Environmental Impact

- There were several papers of interest on the emissions into air and water from landfills, odour impact assessment of a MSW landfill, US EPA research into landfill gas emissions, methane emission quantification from a landfill using a double tracer technique and the consequences of European pollutants release and transfer registers for Dutch landfills; and
- Methods for quantification of methane emissions from landfill are of interest to the EMRC and will be followed up with the researchers and local service providers.

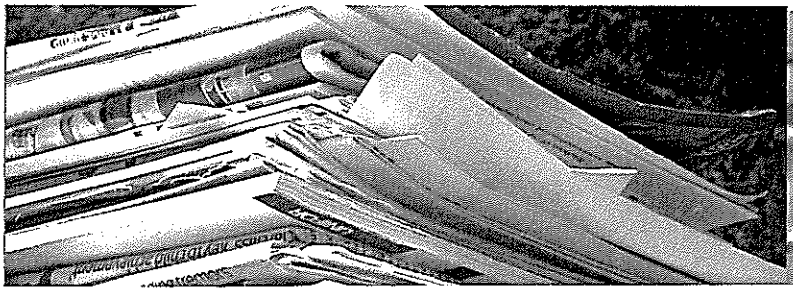
Odour Control in Waste Management

- There were three papers of interest presented on bioaerosols and odour emissions from composting facilities; and
- Bioaerosols or airborne micro-organisms are a potential health hazard. The research work presented was on how to model the dispersion of these aerosols and questions were raised about how to sample for such contaminants.

Closing Session

- Professor Cossu and the other Conference chairmen plus members of the International Advisory Board gave a wrap up of the conference and their views on the past, present and future;
- The past was landfill, the US is now going to wet landfills (bioreactors) compared to Europe (dry landfills);
- Currently, 80 to 90% of landfills have scavengers on them; there are related health effects on these workers;
- Hollywood has discovered climate change;
- Public perception of risk is not fact based in regard to incineration;

- EU has rushed to MBT to meet targets for landfill diversion;
- Over regulation in developed countries;
- Rapid expansion of technology options;
- Separate collection of recyclables is expanding;
- Poor funding and focus on residual waste management.



Public sector support

We're a leading advisor and consultant to the London boroughs. We help them to improve their recycling and waste management services as well as implement best practice on green procurement. We have also offered support on organics customised recycling, through WRAP's (Waste Resources Action Programme) Recycling and Organics Technical Advisory Team (ROTATE).

Our portfolio comprises two websites www.capitalwastefacts.com the knowledge hub of London's waste and recycling and www.capitalwastelearning.com a waste education tool.

Our partnership project, the Recycle Western Riverside campaign is now in its third year. The campaign has promoted cooperation between four local authorities resulting in a co-mingled orange sack recycling scheme for residents. Highlights across the four boroughs:

- paper and cup reduction campaign
- internal co-mingled recycled scheme rolled out to all borough offices
- waste minimisation champion groups of council staff

Achievements

• 11 projects ranging from participation rate monitoring and householder behaviour surveys to running organic waste trials • 5 ROTATE projects • 12 projects through London Remade Solutions Ltd • 18 London boroughs helped to develop and refine their waste and recycling services including: Bexley, Bromley, Croydon, Ealing, Camden, Enfield, Islington, Kingston, Hounslow, Redbridge, Newham, plus work for the four waste authorities
• Waste minimisation initiatives within the four western riverside boroughs
• Launched a recycling scheme at Chelsea and Westminster hospital
• www.capitalwastefacts.com monthly average of 5,519 visits, 400,190 hits
• www.capitalwastelearning.com monthly average of 608 visits, 13,906 hits

Case study

In response to a request by EC1 New Deal for Communities and the London Borough of Islington, we formed a partnership to deliver an estates inventory. The team assessed the potential to improve local areas through development of targeted waste and recycling services. By doing a social and environmental assessment of each block of flats on individual estate, it was possible to design an effective recycling system to overcome participation barriers and drive improvements. As a result, five innovative estates recycling projects are planned, to test the concept and contribute to knowledge about the provision of services both nationally and internationally.

Future

Continue to work with and advise the authorities on behalf of ROTATE and independently through London Remade Solutions Ltd.

Recycling infrastructure

We commissioned market research to identify the amount and type of waste flows in London. Findings highlighted a huge shortfall in facilities with the recycling capacity to meet demand. Therefore if London is to reach its 85 % self sufficiency target and deal with its own waste by the year 2020, there needs to be a huge investment in recycling infrastructure within the next fifteen years.

We've started to increase this capacity with four eco-sites built last year. This year we managed a £2 million fund from the Economic Development Infrastructure Building (EDIB) programme to increase waste infrastructure through economic development.

Achievements

• 80 jobs created, all with accredited training • 1.9 million tonnes of processing and reprocessing capacity created • Over 100,000 tonnes of waste diverted from landfill • 8 projects funded and supported: Powerday, Express Recycling, Grosvenor Waste Management, East London Community Recycling Project (ELCRP), CRISP, Maxitech, Chris Carey Collections and Closed Loop London

Case studies

Express Recycling – plastics reprocessing plant

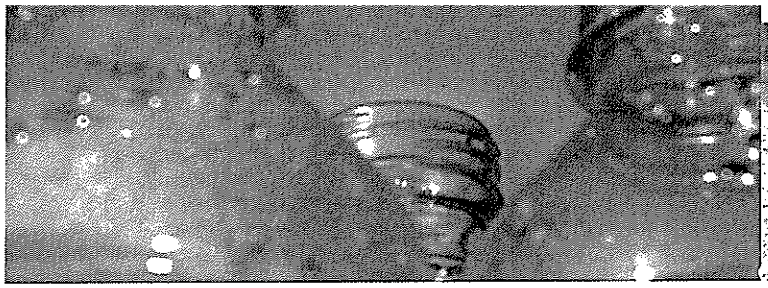
Express Recycling secured £70,000 funding through the EDIB programme to help build London's only plastics reprocessor, capable of processing municipal and end of life vehicles (ELV) mixed plastics. We helped find a suitable location, submit grant applications, source materials and establish contracts with other companies.

Powerday – processing and reprocessing centre for construction and demolition materials, industrial and municipal waste streams

We gave Powerday practical business advice and helped them find the right location, source materials, make links with the academic world, tap funding streams and produce a marketing communications strategy.

Future

Building at least ten new recycling and reprocessing plants in the next five years to create 1.5 million tonnes of reprocessing capacity. We're working towards increasing capacity for municipal as well as household waste.



Closed loop project

Recycling household waste is increasingly becoming second nature. As many as eight out of ten Londoners now receive a collection from home. In contrast, the environmental cost of lunchtime waste is higher than ever with little infrastructure in place to encourage good recycling behaviour. London alone produces approximately 263 tonnes of waste every lunchtime, enough to fill Trafalgar Square every week. This level of waste is simply not sustainable and the UK cannot continue to cope with the amount of rubbish being produced.

Closed loop recycling is an innovative new concept in the UK, focusing on sustainable packaging for the food and beverage industry. Our efforts to encourage market leaders in the retail and fast food sectors to embrace recycling have paid off. The concept is particularly effective when put into practice at large scale events, to encourage food and beverage retailers to use recycled packaging and provide easy access to recycling bins for consumers.

Achievements

• 13 closing the loop projects across: corporate catering, retail fast food, sports event, festival, restaurant, transport and public venues
• Closed Loop London and Marks & Spencer won two awards for ground breaking initiative to use recycled content and fully recyclable food and drink packaging in their 'Food to Go' product ranges. The project won the Tetra Pak Environmental Award at the IGD Food industry Awards as well as the Best Retail Recycling Initiative at the National Recycling Awards, both in October.

Case study - Frieze Arts Fair, October 2005

Exhibits from 160 contemporary art galleries were shown in Regent's Park with 47,000 visitors over five days. A recycling programme was incorporated into the event, due to successful recycling the previous year. The fair generated 21.9 tonnes of waste, 56.6% of which was recycled. This was a 46.7% increase on 2004. The most important factor in this success was that all contractors and service providers were committed to recycling and only compliant packaging was used in the cafes.

Closing the recycling loop

LONDON REMADE

Business development

The quality and range of our networking is renowned across the sector. This year we ran a major programme of networking meetings and invitation-only roundtable discussions. Our September waste summit underlined our status as a major player and think-tank on strategic waste. Elliott Morley, the former Minister of state for Climate Change and Environment, hosted an event on waste electronics and Ken Livingston spoke at our green procurement awards.

On public affairs, we have strengthened our independent position, contributing to regional developments including the consultation on the Mayor's powers and the Mayor's alterations to the London Plan. Nationally, we submitted our views on the government's sustainable procurement taskforce.

A revised sponsorship package attracted a new supporter and enticed three current sponsors to re-sign. We continue to develop new ideas and introduce entrepreneurs to the opportunities around recycled materials through our training programme.

Achievements

• 3 contributions to policy • 18 events • 2 invitation-only discussions
• 5 networking meetings • 4 sponsors secured
• 22 Prince's Trust delegates trained

Future

Develop our fee earning subsidiary, London Remade Solutions Ltd, and devise ways to access charitable funding.