

# **IEA BIOENERGY - TASK 36 (2004-2006)**

## **ENERGY RECOVERY FROM MSW**

**(as approved Meeting - Montreal 19/10/04)**

### **Topic 1 - Product Stewardship / Producer Responsibility**

- A program to project the influence of current / future EPR / PS /PR schemes on the energy recovery potential from residual urban waste streams.
- A proposal for the preparation of a Discussion paper that will review the strategic needs and necessary installed capacities to cater for future needs in OECD countries.
- The scoping of a strategic planning approach to the sustainable recovery of the inherent energy values in residual urban wastes.

### **Proposed Work Plan and Budget**

#### **Introduction**

It is proposed to undertake this project in three stages:

**Stage 1** - to review the theoretical concepts of EPR, PS/PR to better understand the potential to influence / deliver sustainable resource utilisation outcomes.

**Stage 2** - to review the actual experience and measurable outcomes with case studies and comparison of tangible results against (stage 1) potential.

**Stage 3** - synthesis of Stages 2 & 3 to project future potential, and the strategic planning issues that result.

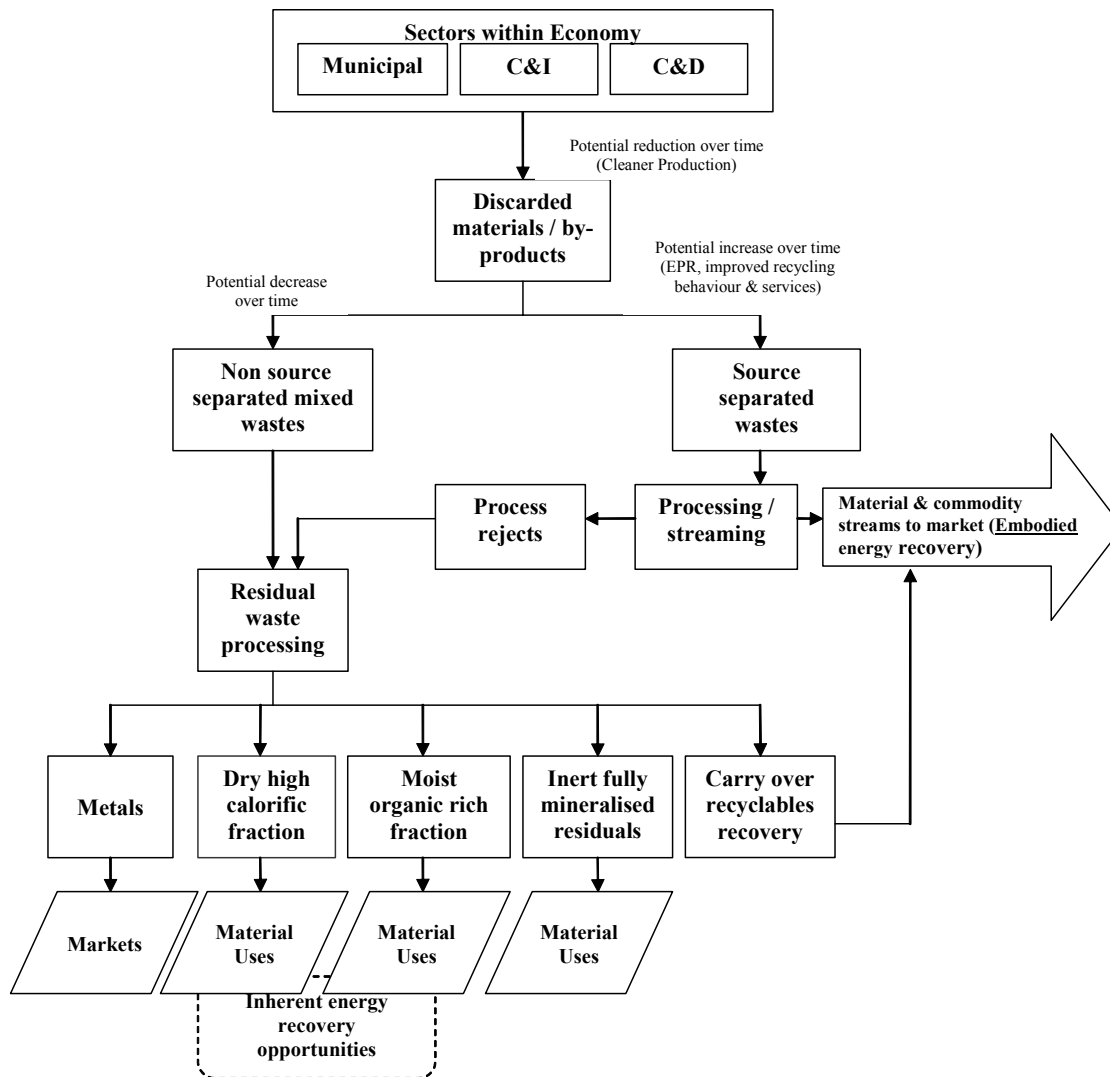
The following Work Plan is structured to reflect the scope, tasks and outcomes of the Briefing Note approved at the Trondheim meeting May 2004 and to interpret them into a sequence of defined work packages.

It is proposed to develop this work with specific contributions from France, the United Kingdom, Sweden? and OECD countries generally.

#### **Stage 1 - To Review the Theoretical Concepts and Potential of EPR / PS / PR**

- This introductory activity would explore the concept of PS/PR as a driver for change in the way resources are applied to the production of (consumer) goods and services.
- The term “urban wastes” is taken to refer to two more generally understood sources - C&I (the spent, surplus, discarded or under valued by-products of the manufacturing process) and MSW (the spent, surplus and discarded post consumer (residential) waste streams).
- “Residual” is taken to refer to those urban wastes that remain after all or any higher value minimisation, reuse, recycling or reprocessing activities have been adopted to recover more homogeneous / source separated fractions.

## Generic Material Flows



- The WMAA EfW Sustainability Guide has been adopted as the process by which residual wastes are determined as having no higher resource value than to be converted for their inherent energy content.

### Background

- The concept of Product or Producer Stewardship aims to focus the primary responsibility for the management of the life cycle impacts for a product or service on the original Brand or manufacturer. This approach builds on the concept that at the time of identification of need for a particular product and/or service, the initiator or product designer is ideally placed to give full consideration to such issues as -
  - i) How the enterprise is resourced (raw materials, labour and utilities) (recovered materials content)
  - ii) How the product is produced (wastes and/or by-products) (C&I wastes)
  - iii) How the product will be packaged, distributed and marketed
  - iv) How the consumer will use the product, and, most important of all in this context,
  - v) **The planned and anticipated post consumer fate of the product or service (including packaging etc.) (MSW wastes)**

- The issues and objectives that arise from such an approach to adopt such a Resource Productivity initiative should be fully fleshed out and referenced.
- The relationship between the consumer product designers / initiators and the post consumer resource recovery sector is crucial in the delivery of Resource Productivity outcomes. Planning for the most appropriate and sustainable post consumer fate of a product or service will only be fully optimised where the available service options are known or planned.

### Summary of Tasks - Stage 1

No.	Task	Budget Person/days \$AUD
1.1	Prepare high level background paper on the prevailing (urban) waste / resource issue with reference to sustainability, historical events and trends and Resource Productivity. The concept of Highest Net Resource Value (HNRV) to be introduced and discussed as a tool to determine strategic options.	2
1.2	Prepare background paper on the importance of decisions made at the point of design / product initiation and the relationship of such decisions to the availability of post consumer resource recovery options for the actual achievement of sustainable outcomes. A supply chain mapping exercise prepared in consultation with product designers/ initiators and the existing post consumer resource recovery sector (the waste and recycling industry).	3
1.3	Scope the post consumer services and capabilities necessary to fully complement the range of “design intent” options.	3
1.4	Synthesis 1.1, 1.2 and 1.3 to present a vision of the potential for PS / PR schemes to work as planned and conceived, expressed in terms of sustainable energy and material flows, the emergence of service based economies and the social, environmental and economic outcomes.	4
	<b>Sub Total</b>	<b>12 Person/days</b>
	<b>AUD</b>	<b>\$12,000.00</b>

### Conclusion of Stage 1

At this point a view of the ‘perfect world’ potential of PS / PR schemes will be presented for comparison with actual achievements (Stage 2) and future projections (Stage 3).

## Stage 2 - To Assess Actual Performance / Experience PS/PR case Studies and measured results

To be undertaken with regard to actual programs, experience and case studies.

### Summary of Tasks - Stage 2

No.	Task	Budget Person/days \$AUD
2.1	To prepare a review of the generic types and structures of EPR - PS PR schemes in operation in Australia, France, the United Kingdom, Sweden and Canada.	2
2.2	Desktop study of short list of schemes to consider: <ul style="list-style-type: none"> <li>▪ Legislative framework - Compulsory, Voluntary, Industry managed, Co-regulatory</li> <li>▪ Financial framework - levy/benefit, value chain cost as % of RRP etc.</li> <li>▪ Operational structures and details</li> <li>▪ Social issues</li> <li>▪ Technical issues</li> <li>▪ Participation and outcomes</li> <li>▪ Relationship of schemes to product design intent</li> <li>▪ Where possible assess before and after kerbside</li> </ul>	20
2.3	Review of new and/or emerging schemes / approaches	2
2.4	Review of embodied vs inherent energy recovery issues in studied schemes	2
2.5	Survey of urban residuals audit data to gauge impact of PS / PR schemes on volume and quality of generic fractions: <ul style="list-style-type: none"> <li>▪ Dry high calorific fraction</li> <li>▪ Moist lignocellulosic fraction</li> <li>▪ Metals</li> <li>▪ Inert / fully mineralised fraction</li> </ul> <p>NB Identify influence on quality where HHW initiatives are operational</p>	15
	<b>Sub Total</b>	<b>41 Person/days</b>
	<b>AUD</b>	<b>\$41,000.00</b>

### Conclusion Stage 2

At this point the desktop assessment of case studies and actual schemes and real experience will indicate:

- The level of influence PS / PR schemes are having on residual urban waste quality and volumes
- Issues arising from practical experience that could inform future planning and capability building.

### Stage 3 - Projections for installed capacity requirements

This synthesis and extrapolation stage seeks to scope the generic systems and infrastructure needs that should be available if energy recovery (embodied and inherent) from residual urban wastes is to be put on a sustainable footing.

The potential influence of ongoing PS /PR programs will inform an assessment of the underlying trends that support such projections.

#### Summary of Tasks - Stage 3

No.	Task	Budget Person/days \$AUD
3.1	Compare potential effect of PS / PR programs (Stage 1) with actual experience (Stage 2) and project future impacts for future planning.	5
3.2	Develop estimates of quality, quantity and conditions relating to the availability of potential fuels / energy products sourced from residual urban wastes.	5
3.3	Discussion Paper on issues and matters arising that will include conceptual models of the facilities, capabilities and technologies required to fully optimise the recovery of inherent (and embodied) energy from residual urban waste streams (in OECD countries).	10
	<b>Sub Total</b>	<b>20 Person/days</b>
	<b>AUD</b>	<b>\$20,000.00</b>

#### Conclusion of Stage 3

The WMAA EfW Sustainability Guide proposes a structured decision making process for the recovery of energy from residual urban wastes, once it has been established that they have no higher resource value than to be converted to energy. This project will provide an initial, high level assessment of the volume and characteristics of such materials. Simultaneously usefully information will be derived to inform the design and implementation of PS / PR schemes in the future.

The Stage 3 outcomes aim to be of particular value to:

- Strategic infrastructure planning
- PS / PR system improvements and scheme design
- Developers, providers, operators of specific energy recovery facilities

### Summary of IEA Approved Project Budget

Task	Person / Days	\$AUD	2004	2005	2006	Total
Set up travel		\$6,000	\$6,000			
Stage 1 works	12	\$12,000	\$12,000			
May travel		\$6,000		\$6,000		
Oct travel		\$6,000		\$6,000		
Stage 2 works	41	\$41,000		\$41,000		
May travel		\$6,000			\$6,000	
Oct travel		\$6,000			\$6,000	
Stage 3 works	20	\$20,000			\$20,000	
Project Management	9	\$9,000	\$1,500	\$6,000	\$1,500	\$9,000
Report printing & distribution		\$5,000			\$5,000	\$5,000
Secretarial / admin	5	\$3,000	\$1,000	\$1,000	\$1,000	\$3,000
Contingency		\$12,000		\$8,000	\$4,000	
<b>Annual Cash Flow</b>		<b>\$132,000</b>	<b>\$20,500</b>	<b>\$68,000</b>	<b>\$43,500</b>	
<b>How funded:</b>						
▪ Membership - 125 x \$25			\$3,000	\$3,000	\$3,000	\$9,000
▪ Cash at bank (Division reserves)			\$6,000	\$6,000	\$6,000	\$18,000
▪ Task 36			\$7,000	\$7,000	\$7,000	\$21,000
▪ WMAA - General support project funding			\$10,000	\$10,000	\$10,000	\$30,000
▪ Sponsors - cash SAY				\$20,000	\$20,000	\$30,000
▪ Sponsors - in kind SAY				\$16,500	\$16,500	\$24,000
<b>Total Funding</b>			<b>\$26,000</b>	<b>\$62,500</b>	<b>\$43,500</b>	<b>\$132,000</b>
Difference			<b>\$5,500</b>	<b>(\$5,500)</b>	-	
Project Cash Flow			<b>\$5,500</b>	-	-	

### Original Project Budget and Cash Flow amended for the effects of time slippage at start up

Task	2004	2005	2006	Total
Travel	\$6,000			
Stage 1 works		\$12,000		
Travel		\$12,000		
Stage 2 works		\$41,000		
Travel			\$12,000	
Stage 3 works			\$20,000	
Project Management	\$1,500	\$6,000	\$1,500	
Report printing & distribution			\$5,000	
Secretarial / admin		\$2,000	\$1,000	
Contingency		\$8,000	\$4,000	
<b>Annual Cash Flow Total</b>	<b>\$7,500</b>	<b>\$81,000</b>	<b>\$43,500</b>	<b>\$132,000</b>
<b>Funded:</b>				
	<b>Pre Budget 2004</b>	<b>2005</b>	<b>2006</b>	<b>Total</b>
▪ Membership - 125 x \$25	\$3,000	\$3,000	\$3,000	\$9,000
▪ Reserves (\$18,000 Division funds)	\$4,500	\$7,500	\$6,000	\$18,000
▪ Task 36 (IEA Bioenergy)		\$21,000		\$21,000
▪ WMAA - General support project funding		\$15,000	\$15,000	\$30,000
▪ Sponsors - cash SAY		\$20,000	\$10,000	\$30,000
▪ Sponsors - in kind SAY		\$16,500	\$7,500	\$24,000
<b>WMAA - requested project funding</b>		<b>\$25,500</b>	<b>\$24,000</b>	<b>\$57,000</b> 43%
<b>Industry - contributions and sponsorship</b>		<b>\$57,500</b>	<b>\$17,500</b>	<b>\$75,000</b> 57%
<b>TOTAL</b>				<b>\$124,500</b>

