Response to the Western Australian State Sustainability Strategy

This paper is a submission from The Marketplace Company Pty Ltd to the Western Australian State Sustainability Strategy – September 2002.

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Executive Summary and Introduction

Introduction to this paper's position

The Western Australian State Sustainability Strategy (the 'Strategy') presents a vision and an action plan designed to "meet the needs of current and future generations through simultaneous environmental, social and economic improvement."

The Strategy lays a strong foundation for such development and proposes the changes in behaviour and investment that will be necessary to achieve its ambitious goals.

The major weakness of the Strategy is the insufficient attention paid to the role that financial incentives can play to bring about the desired changes in behaviour and investment. There is overall little to no focus on the opportunity to apply economic instruments that support the Strategy's goals.

This submission focuses on the issues of waste management and the conversion of waste into a recovered resource. The strategy states that the Waste Management Board is to prepare a detailed plan for each stream outlining how Western Australia will achieve the goal of zero waste by 2020.

In this submission, M-co focuses on the strength of market-based mechanisms to achieve an integrated solution to the seemingly discrete but actually interdependent areas of waste management, natural resource management and sustainable economic development.

The cost of not using such a mechanism is inefficient allocation of society's resources, and the possible failure of the Strategy to deliver its policy objectives. The development of the best possible framework for sustainable resource use will occur under the right conditions and importantly with the right market design and incentives.

The Submission finishes with details of the Sustainable Resources Project and how it addresses Western Australia's key environmental issues.

We would be happy to elaborate on this submission or the Sustainable Resources Project. Contact details are provided on page 22.

Developing the sustainable waste to resource industry

Underlying market barriers

Waste management in Western Australia has been dominated by monopolistic collection and disposal to landfill. The development of an environmentally sustainable waste management industry will require significant investment in new technology and infrastructure, and a paradigm shift in the agronomic production systems of food and feed to utilise the recovered organics from the processed waste streams.

Given the relatively high cost of developing such technology and infrastructure, existing forms of waste disposal, particularly current land-filling practices (that are subsidised by future generations), will continue in the absence of either:

- Penalties (taxes) being placed on current waste practices, which force alternatives to emerge (such as the Waste Board's Waste Levy; or
- Incentives being paid to parties that provide new environmentally sustainable waste processing methods.

The advantages of a market-based approach over a taxation-based regime are discussed in more detail below.

The disadvantages of a tax-based mechanism

A tax on waste is one way to address its negative externalities but such a mechanism suffers several disadvantages:

- It is always difficult to determine what the appropriate tax should be;
- Investment decisions, through the flow of tax revenues, are placed in the hands of central planning agencies. As a generalisation, however, such mechanisms fail to provide accurate (if any) price signals upon which wise investment decision-making can occur. In addition, accurate assessment of the efficiency or effectiveness of the measure is likely to be difficult;
- The risk inherent in redistribution or investment decisions is wholly absorbed by the 'central planner' – namely the government, or ultimately the taxpayer. As central planners typically suffer from considerable information asymmetry, it is not clear that they – rather than the private sector – are best placed to assess these risks;
- The tax-based mechanism has a tendency to cloud or confuse behaviour of those participating in the measure. This often results in undesirable or unintended outcomes. Distortions in the form of evasion, deliberate waste, graft, or unintended beneficiaries can typify these arrangements.

Disillusionment over the flaws in centrally planned tax-based mechanisms has seen a growing realization that many public policy objectives can be more effectively addressed through the adoption of market-based mechanisms.

The power of markets

The economic principles underlying the market-based approach are:

- Creation of a new market with transparent price discovery around the value of sustainable waste treatment;
- Increasing information as to the financial rewards for those meeting demand for sustainable waste treatment; and
- Increasing economic incentives for sustainable resource management.

The two critical elements of a market-based policy mechanism are:

- The creation of a property right for sustainable waste management, to be used as an "offset mechanism" against waste generation;
- A regulatory liability or obligation to purchase the certificated offset mechanism, which also defines who is required to comply. The imposition of penalties for non-compliance creates incentive for liable parties to comply.

Creating a property right is a precursor to discovering the price that the marketplace puts on sustainable waste management. Exchange mechanisms facilitate the establishment of a price at which the offset mechanism is transferred from the creator of the offset mechanism to the liable party.

Price discovery enables society to make more optimal decisions, with no investment decision-making or risk assumed by policymakers. Markets allow the most efficient use of resources to meet a specific goal, with least–cost solutions the most successful. Investors rely on the pricing signal to determine the economic viability of their decisions, leading to **a** flow of capital to projects that most efficiently meet the waste reduction and resource recovery policy objectives.

An example MBI – the REC

The Renewable Energy Certificate (REC) provides an example of how a maket-based instrument (MBI) can be used to achieve desired policy objectives.

The Mandatory Renewable Energy Target (MRET) in the *Renewable Energy (Electricity) Act 2000* calls for a total of 12% of energy production from renewable sources by 2010.

In order to achieve this objective, the scheme creates:

- A liability upon wholesale purchasers of electricity to submit a number of RECs equal to their mandated renewable power percentage;
- A property right for the 'green nature' of electricity produced by eligible renewable generation sources;
- A mechanism of exchange that allows liable parties to purchase RECs from their accredited creators.

The scheme results in:

- The discovery of the most efficient price to meet the mandated renewable energy targets;
- A flow of revenue to renewable generation sources that enables them to compete with non-renewable generators.

Comments on the Strategy

Key actions – missing, or needing amendment

The Strategy identifies the need to change current behaviours and to invest in support frameworks (e.g. reprocessing facilities and collection systems). The strategy fails to identify the need to create economic incentives to bring about these changes.

The Strategy lacks such incentives in all key actions. Instead it proposes a series of programs to explore opportunities for improvement. The key barrier to its success is the gap between stakeholders' incentives and the actions that are desired of them.

Recommended solution:

- Create a market-based instrument (MBI) that represents a property right for sustainable waste management;
- Create a new market with transparent price discovery around the value of sustainable waste treatment;
- Impose a liability upon waste generators to offset a mandated proportion of their activity through the purchase of the MBI.

The result would be to incentivise sustainable resource management at every point in system, leading both to waste avoidance and increased resource recovery.

Targets

The Strategy proposes ambitious waste prevention and resource recovery targets, but:

- There is no guaranteed link between the specific goals and targets as proposed and such a large diversion of waste from landfill to recovery;
- While reporting is suggested, mandatory targets for key waste generators are not.

Historically, voluntary targets have proved ineffectual. Mandatory targets are much more successful in achieving outcomes.

Recommended solution:

- Impose a liability on waste generators to create or purchase a number of the certified offset instrument, calculated as a certain proportion of their waste;
- Set this percentage such that the aggregate amount of sustainable waste treatment is equal to the Strategy's targets.
- Set a price for non-compliance such that there is a financial incentive to encourage desired behaviour and investment.

Barriers, costs or issues that will impair Strategy implementation

The primary barrier to increased uptake of resource recovery technologies in Western Australia is the current low-cost of landfill disposal. It reflects:

- The insulation of the waste management industry from market forces that would discover the value that society places on alternative treatment;
- A subsidy paid by future generations who will have to deal with the unaccounted for externalities of current practices.

Recommended solution:

- Impose a liability on waste generators to create or purchase a number of the certificated offset instrument, calculated as a mandated proportion of their waste;
- Set the price for non-compliance such that it is more efficient for waste generators to discharge their liability through eligible offset activities, or through the purchase of certified offset instruments from other parties.

By setting the price of non-compliance higher than the price to supply offset activities, there will result an immediate increase in the flow of capital to those operations that offer the most efficient (and hence cheapest) environmentally and socially beneficial systems.

Approach

On Page 201 of the Strategy, Sylvia Tetlow is quoted "We need to put a true monetary value on our enjoyment and use of our natural environment and biodiversity." What she has effectively stated here is that there needs to be an accurate price signal that reflects the 'sustainable value" of the environment. This estimation is best achieved through the use of market-based instruments that lead to transparent price discovery and efficient resource allocation.

In its mixture of tools, the Strategy includes economic analyses that estimate the impacts of activities on environmental and social amenities. It identifies the problem that no market exists for the amenities, rendering subjective the value that is placed on their loss.

This approach is consistent with a taxation-based regime, where a central agency is responsible for evaluating investment decisions, and raises consequent issues of sub-optimal resource allocation.

Recommended solution:

- Create a property right for sustainable waste treatment;
- Create a mechanism for its exchange,
- Set a price for non-compliance by liable parties that is higher than the price to supply sustainable waste treatment.

The result would be discovery (by normal market dynamics) of the most efficient price to supply the desired amount of sustainable waste treatment. Such price discovery enables the most efficient allocation of resources to achieve the desired outcomes.

Market development for recovered resource streams

The Strategy hints at the need to establish and develop frameworks and structures (markets?) to enable recovered materials to be re-used and recycled. In the area of waste as 'Solid Organic Matter' (SOM), this implies that waste needs to be recycled as feedstock for new products as a key action to increase the use of renewable and recovered materials (p149).

The support programs that are outlined (p150) will be ineffectual unless backed by financial incentives for both:

- Input – incentives for collection and treatment;
- Output – incentives for storage, distribution and marketing.

Recommended solution:

- Impose liability on waste generators to offset a mandated proportion of their activity by the creation or purchase of certificated instruments;
- Make it an eligibility requirement for the creation of the offset instrument that recovered resources be sold into accredited sustainable markets.

The resulting flow of revenue would support both the input and output stages of these markets. Also, the market ensures that the supply of offset instruments will only be equal to demand, which is the mandated liability of waste generators. Consequently the development of demand for recovered resources will be proportionate to their supply.

Influencing whole of system behaviour

The Strategy adopts a whole of system approach, and recommends action at every stage of the life cycle of goods and services to avoid and prevent waste (pp 148-9). However, it does not propose the incentives that will bring about desired actions.

Recommended solution:

- Impose a liability upon waste generators for unsustainable waste disposal;
- Create a penalty for non-compliance.

Cost would be created in any part of the product lifecycle that results in unsustainable waste disposal, with a consequent influence on whole of system behaviour towards sustainable outcomes.

Increased effectiveness of Waste Levy and other economic instruments

Setting the value of taxes to encourage sustainable outcomes is difficult, and requires an estimate of the total cost of unsustainable practices.

Recommended solution:

- Create a property right for sustainable waste management;
- Create an exchange mechanism that allows the market to discover its value;
- Replace the waste levy with a liability upon waste generators to submit a number of certificated offset instruments that would represent the mandated proportion of waste to be diverted from landfill to alternative treatment.

The discovery of the market value of sustainable waste management allows the value of other economic instruments (such as local governments' domestic waste charges and Advance Disposal Fees) to be set accurately.

Improved adoption of new technologies for resource use & recovery

The Strategy identifies the need for an improved process for the evaluation of new technologies to improve resource use and recovery. It should integrate strategic context, economic, environmental and social costs and benefits, at a local and regional level, and consider the whole materials flow system.

Recommended solution:

- Development of ways to assist the commercialisation of technologies;
- Improvement of the environmental performance and efficiency of existing technologies;
- Establishment of the suitability of technologies and practices for regional applications.

Development of ways to assist the commercialisation of technologies	By improving the price transparency of landfill disposal, the market-based offset instrument allows informed decisions by all stakeholders in the waste management and resource recovery industries. This will allow resource recovery technology developers to directly compare the cost-benefit ratios of their technologies to that of landfill.
Improvement of the environmental performance and efficiency of existing technologies	Several proven resource recovery technologies are already operational, both here in Australia and overseas. However, for most of these facilities to be commercially viable, they require a gate fee higher than the majority of landfill charges currently applied throughout New South Wales. The artificially low cost of landfill is the single greatest market barrier preventing further research and development into process and market development activities. To match current landfill gate fees, resource recovery operations can only offer a partial solution instead of the full resource recovery option available within each of these technologies. It is expected that the creation of market-based offset instrument will reveal the market value of sustainable waste disposal to be significantly higher than current landfill gate fees in NSA. This cost can be compared to available resource recovery technologies, allowing the most efficient technology that takes into account its long-term environmental and social impact to be utilised for a given area. All resource recovery technologies would be fully supportive of this initiative.
Establishment of the suitability of technologies and practices for regional applications	Any sustainable waste management strategy must focus on the organic fraction of recovered waste, as well as the inorganic. The requirement that eligible creators of the offset instrument deliver recovered resources to accredited markets can be used as part of an integrated system to develop sustainable production systems in rural Australia. Recovered organic resources would have to be converted into accredited, performance-specified organic soil ameliorants and fertilisers and delivered to the 'farm gate' to address the natural resource management issues of water and land degradation, and loss of biodiversity, facing rural Australia. The closure of the 'carbon resource loop' (reversing the mass nutrient flow from rural to urban areas) would create sustainable agronomic practices, and sustainable industry development – particularly in rural Australia.

Conclusion

The best way to achieve the Strategy's goals

By failing to provide incentive mechanisms, the Strategy risks failing to deliver its policy objectives.

In the pursuit of these desired outcomes, the adoption of a market-based mechanism will create the most efficient allocation of resources, and the strongest and clearest incentives.

By discovering the price of sustainable waste management, a market based mechanism supports the four broad stated goals of the Strategy:

1. *Waste avoidance*

Price discovery and the creation of an economic instrument allow the costs of sustainable waste management to be passed on to waste generators, creating an incentive for waste avoidance through consumer choice, systems improvement, and product & process design.

2. *Resource recovery*

A market-based offset instrument supports the development of markets for recovered resources, and price discovery the most efficient allocation of capital to achieve re-use, reprocessing and energy recovery.

3. *Reduced toxicity in products and materials*

The discovery of the market value of sustainable waste management (including the negative externalities of toxicity) will create an incentive to:

- Design products and processes such that special disposal is avoided;
- Allocate capital to the most efficient and appropriate technology to treat these contaminants and toxic materials to minimise the environmental, social and economic impacts of remaining disposal.

4. *Reduced litter and illegal dumping*

By supporting the development of markets for recovered products, the market-based mechanism creates an incentive to dispose of waste by a means that its inherent resource value can be realised.

Project Summary – The Sustainable Waste to Resource Project

Addressing Western Australia's most pressing environmental issues

The Sustainable Waste to Resource Project (the 'Project') addresses a number the key environmental issues raised in the Strategy:

- Water Quality, through the reduction of nutrient and pollution loads entering urban and rural water systems;
- Land Degradation, by directly addressing the continual loss of soil organic matter (SOM) through the addition of carbon as performance-specified composted organics back into the soil (this has the added indirect advantage of aiding in the prevention of and restoration to saline-affected areas); and
- Maintenance and Restoration of Farming Land Bio-diversity, indirectly through providing the carbon-based inputs to sustainable agronomic production systems.

The continual removal of carbon from Western Australia's agronomic production systems and the associated loss of SOM have severely compromised the soils' ability to maintain productive yields over the long-term.

One part of an integrated, ecologically sustainable solution to these issues lies in the method of treating (processing) Western Australia's household and commercial solid waste streams. Current waste disposal methods, based largely on landfill and thermal destruction, are not only expensive but have significant adverse environmental impacts. The process of either destroying or dumping the solid waste stream inevitably means a net loss from the 'resources cycle', the consequences being over-exploitation of the remaining finite resources and environmental degradation of water, land and atmosphere, as the ecological leakage costs (the externalities) are not fully accounted for.

The Project provides a market-based instrument called the Sustainable Resource Certificate (SRC) that will incentivise alternative waste treatment processors to recover the organic (and inorganic) resources inherent within these waste streams in their highest net value form, and effectively compete with current environmentally damaging and unsustainable waste disposal practices. Each SRC represents one tonne of waste that has been diverted from landfill and converted into recovered resources, with the organic fraction being used to address the Natural Resource Management (NRM) issues listed above.

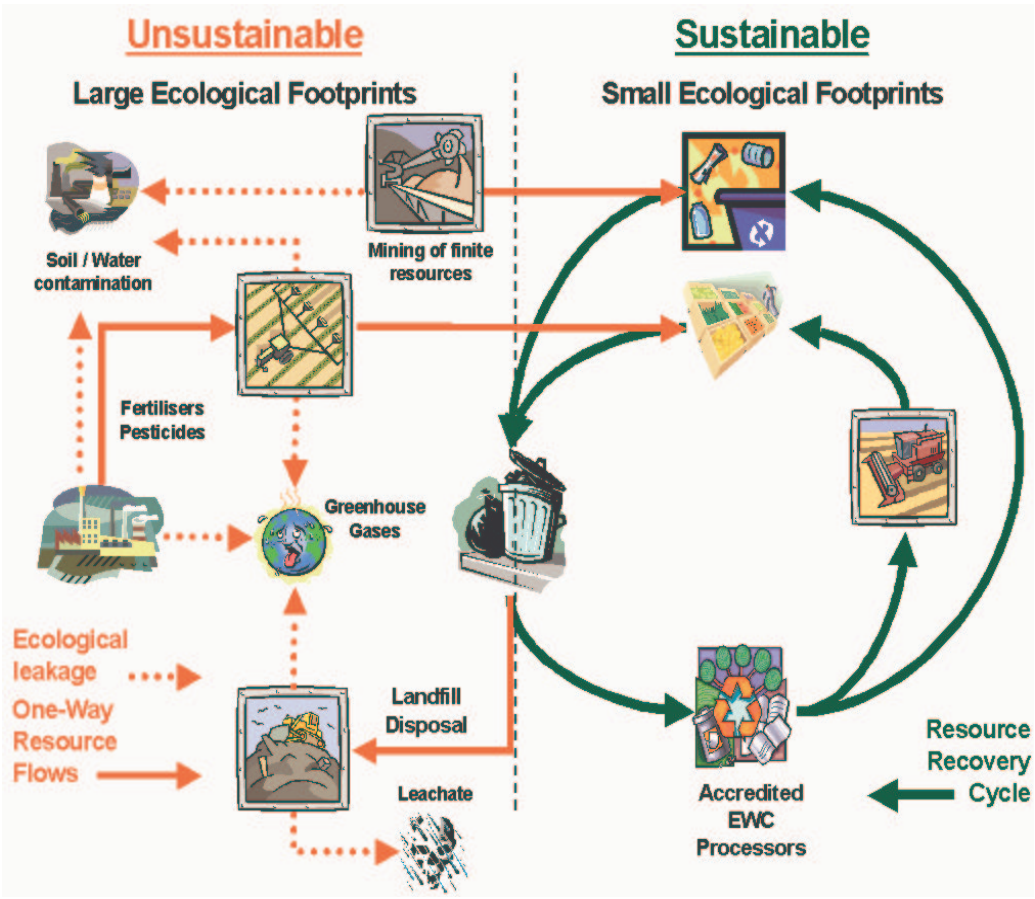
Upon successful implementation of the Project, performance-specified 'carbon-based' inputs will be produced by accredited waste-to-resource processors (SRC processors) that can be used as part of an integrated system to develop sustainable production systems in rural Australia. The supply of these 'carbon-based' inputs to the farm-gate will arrest the decline in SOM, thus reducing the unsustainable impact of current agronomic production systems on land and water quality. This will lead to the closure of the 'carbon resource loop' and reverse the mass nutrient flow from rural to urban areas.

Addressing Western Australia's most pressing environmental issues

Thus the aims of the Project are to:

- Provide performance-specified organic products to Western Australia's agronomic production systems to address the environmental issues of land degradation and loss of biodiversity, and the associated issue of water quality; and
- Reduce the ecological footprints of both rural farming practices and current waste disposal methods through more efficient resource allocation, reduced mining of finite resources and reduced applications of chemical fertilisers and pesticides as part of an integrated approach to sustainable food and feed production.

The Sustainable Waste-to-Resource cycle



Addressing Western Australia's pressing environmental issues

Resource management problem addressed by the Project

The Sustainable Waste to Resource Project addresses the key environmental issues of:

- Water quality;
- Land degradation and, indirectly, the causes of salinity; and
- Maintenance and restoration of farming land bio-diversity.

The Project does this by seeking to change the current environmentally unsustainable practice of dumping or destroying Western Australia's household and commercial solid waste streams. These streams, if correctly treated, can become significant sources of products that will complete the resource cycle by sustainably reusing society's waste.

The Project seeks to achieve the following environmental outcomes:

- Improved water quality through:
  - An improved capacity of the soil to retain nutrients and moisture, leading to a reduction in eutrophication and sedimentation of rural water systems caused by nutrient run-off and soil erosion respectively;
  - A reduction in groundwater contamination caused by the leachate from landfill operations; and
  - An overall reduction associated with greater efficacy in the use of chemical pesticides and fertilisers on agronomic systems, leading to a commensurate reduction in contaminated water spillover.
- The restoration of farming land bio-diversity through the replenishment of the soil with organic materials recovered and treated from household and commercial solid waste streams; and
- A reversal in land degradation through the direct application of products containing carbon (and other essential nutrients) to arrest and eventually improve soil organic matter levels, with the added benefit of treating some of the causes that lead to salinity.

The Sustainable Resource Certificate

The proposed MBI – the Sustainable Resource Certificate

The key knowledge gap being filled by the proposed project is that associated with understanding the economics and environmental benefits from sustainable treatment, recovery and reuse of the household and commercial solid waste streams.

The Project proposes to establish a regime to facilitate the creation of an incentive offset instrument - the **Sustainable Resource Certificate** (SRC). An SRC represents the amount of waste diverted from landfill or thermal destruction in an accredited and environmentally sustainable manner. An SRC would only be able to be created by accredited waste processors. Accreditation would be determined based on the waste processors' verified method of waste treatment and sale of the recovered resources into environmentally sustainable markets.

Accredited processors would become eligible to create SRCs based on the amount of waste that was diverted from landfill or thermal destruction. These certificates, once created, would be registered and able to be purchased by parties seeking to have demonstrated that their waste is treated in an accredited and environmentally sustainable manner. Targeted buyers of SRCs include local councils, industrial companies and even households.

Definition of an SRC

One SRC is based on one (1) tonne of input treated waste. An SRC of magnitude one (1) corresponds to a 100% diversion of the waste stream from landfill into recovered resources.

For example, if:

- 100 tonnes of waste was received by an accredited waste treatment facility; and
- 10 tonnes was on-forwarded as non-processed residuals; leading to
- 90 of the original tonnage of waste being sustainably treated;

then the accredited waste treatment facility would be entitled to create / sell 90 SRCs in the market.

Objectives of the Project

Objectives and Outcomes of the SRC Program

Environmentally sustainable waste management is a critical link in Western Australia's Sustainable Strategy that must encompass the principles of ecologically sustainable development. Sustainability within the 'waste' management industry therefore must work towards the closure of all resource recovery loops at their highest net value for each and every resource that is a component of what is collectively referred to as a 'waste stream'.

The SRC pilot program primarily aims to create this mechanism through developing two diversion factorials, which, when combined, provide a total diversion rate of the household and commercial solid waste streams from landfill:

1. The recovery of the inorganic fraction of the waste streams into:
    - Hard recyclables (glass, paper, metals, plastics); and
    - Other resources suitable for existing or new niche markets (textiles, wood, rubber, etc.);
2. The conversion of the organics entrained in the waste streams into accredited, performance-specified organic soil ameliorants and fertilisers.

More specifically the SRC program seeks to encourage waste processors to increase their productive capacity by using the revenue generated from the sale of an SRC to incentivise the development of sustainable markets for the recovered resources. In particular to develop sustainable agronomic production systems, thus improving farmland biodiversity, water quality and reducing land degradation. The incentive then exists to place the performance-specified organic products at the farm-gate, at an affordable price.

Evaluation criteria

The Project would aim by 2020 to have 100% of Western Australia's disposed household and commercial solid waste being brought within the SRC Program.

Funding requirement

Funding is required to enable the Project to be implemented. The major costs associated with the implementation of the Project are estimated as:

Program establishment and work stream scoping	$60,000
Initial program development and ongoing consultation with key stakeholders	$300,000
Development of Program governance and decision-making	$150,000
Formal establishment of standards, accreditation rules and certification processes - Landfill Rate Study - Organics Validation Study - Development of Sustainable Waste Treatment Accreditation Standards	 $300,000 $400,000 $100,000
Listing of certificates on the GEM™ and development of internet registry and trading platform	$100,000
Pre-marketing and program signup – concurrent with above activities	$100,000
Total estimated funding requirement	**$1,510,000**

Accreditation, Validation and Verification

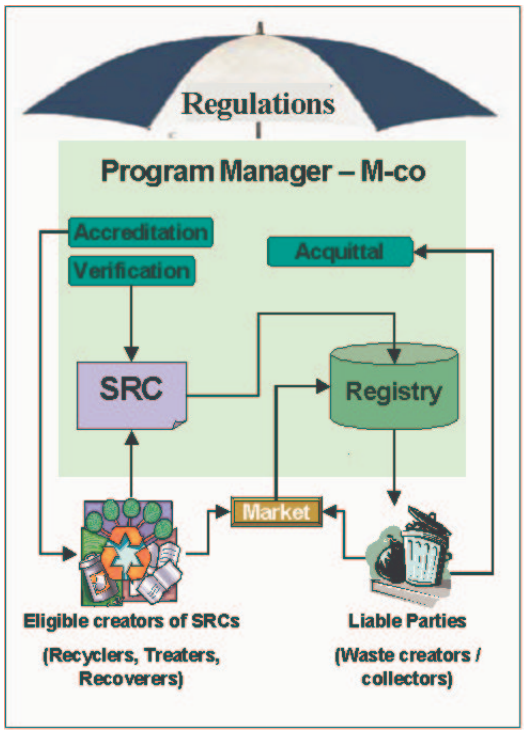
Validation and verification of the SRC will be through the total diversion rate of household and commercial solid waste streams, the definition of 'input' being the amount of waste received from waste creators less the amount of waste on-forwarded as non-processed residual to landfill or thermal destruction.

As SRCs represent the most sustainable method of resource recovery of the waste stream, thermal destruction of these resources cannot be classified as environmentally sustainable as other resource recovery options that currently exist. Therefore, the thermal destruction of the waste stream cannot be classified as a process to obtain an SRC (it should be noted that the combustion of organic waste to produce electricity is eligible for Renewable Energy Certificates - RECs).

Property rights, or tradable entitlements, are created and 'certify' the resource-diversion entitlement that each SRC represents. Purchasers of SRCs are thus assured that each SRC represents 1 tonne of waste that has been sustainably diverted, with the resultant recovered resources having performance specifications that meet the requirements of the following market demand centres:

- Organics into agronomic production systems; and
- Recyclables and other inorganic resources into their respective markets.

The following diagram illustrates the MBI concept.



Underlying rationale

The key principles of sustainable waste management include:

Reduction –	Minimising waste generation, including all emissions;
Recovery –	Maximising recovery of resources from the waste stream for reuse or recycling; and
Recycling –	Maximising recycling (for another use) of all portions of the waste stream, including the organic matter.

Household and commercial solid waste disposal methods in Western Australia are currently dominated by simple landfill. Landfill and thermal destruction disposal methods do not achieve the key principles listed above, and landfill in particular is now globally recognised as being ecologically unsustainable. There is clear recognition that these current waste disposal methods are having a serious and detrimental effect on the water tables, surrounding land and the overall environment (particularly through the generation of greenhouse gases).

It is socially and environmentally irresponsible for society to not use the resources contained within these waste streams at their highest net resource value, particularly the organics being incorporation back into the soil profile.

With the immediate need for soil organic matter to aid in the arrest of soil and water degradation and in the maintenance and restoration of bio-diversity in Western Australia's agronomic production systems, the transferral of these recovered organics from the waste streams to Western Australia's farmland is just plain common sense. It is a win-win situation.

Key outcomes

The key outcomes of the development of this Project are:

- The price signal for an SRC, based initially on buyer (waste creator) demand and supply of SRCs from accredited waste processors. The greater the demand, the higher the price of an SRC. The higher the price for an SRC, the greater the financial incentive for developers and operators of sustainable waste processing operations;
- Means for enabling waste creators to treat their waste in an auditable, verifiable and environmentally sustainable manner;
- Sustainable industry development – particularly in rural Australia;
- Reduction of pollution risk to water tables;
- Closure of the carbon loop for agriculture / horticulture and avoidance of the increasing need for chemical fertiliser and pesticide usage;
- Higher value use of scarce available land in urban areas;
- Reduced need to mine finite raw materials; and
- Reduction in greenhouse gas emissions.

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