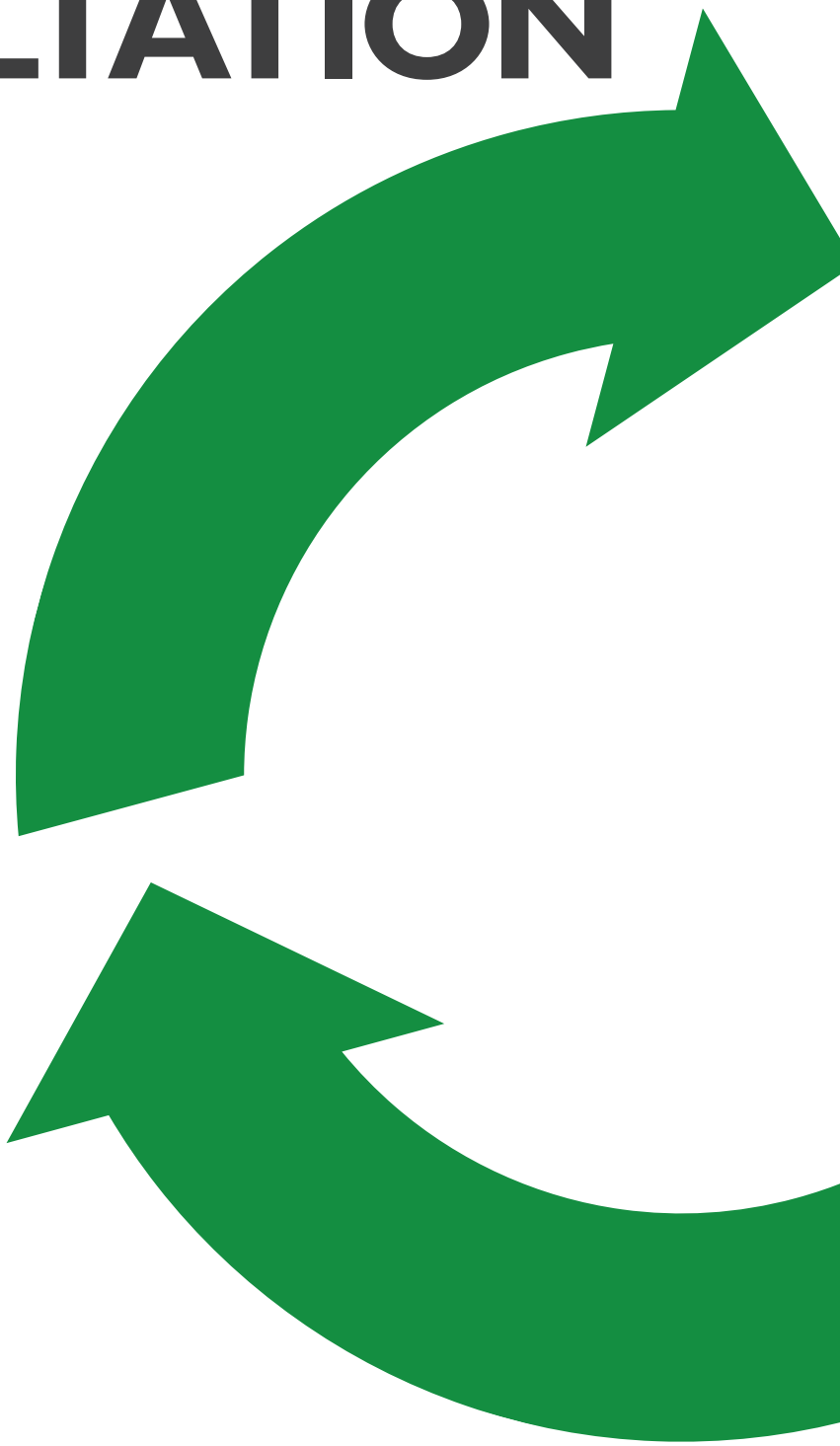
Zero Waste SA

INTERIM CONSULTATION PAPER

Zero Waste SA Position on Waste to Energy

September 2013



Government of South Australia
Zero Waste SA

AVOID • REDUCE • REUSE • RECYCLE

This paper provides a platform for Zero Waste SA to commence dialogue with stakeholders and other relevant Government agencies with the aim of developing a State Government policy position on waste to energy.

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Executive Summary

South Australia is recognised internationally for its leadership in resource recovery and renewable energy. Waste to energy brings these two areas together to provide economic development and environmental management opportunities that are new to South Australia.

Waste to energy technologies fit into three categories, as follows, some of which could be established in South Australia if the market conditions are right:

- **conventional combustion** – combusts waste to produce heat energy which can be used directly or converted to electricity;
- **anaerobic digestion** – anaerobic decomposition (without oxygen) of organic waste which produces methane that can be combusted to produce heat which can be used to generate electricity;
- **advanced thermal technologies** – high temperature combustion of wastes that produces heat energy and combustible fuels which can be used directly or converted to electricity; by-products include carbon fibre which could be used as a carbon sink (for example, storing carbon in soils).

This Interim Consultation Position Paper on Waste to Energy (Interim Position Paper), in combination with the Waste to Energy Background Paper (Ricardo-AEA, 2013), provides a platform for Zero Waste SA (ZWSA) to commence dialogue with stakeholders and other relevant Government agencies with the aim of developing and securing endorsement to formulate a State Government policy position on waste to energy.

Key policies and regulations that influence the development of waste to energy policy positions are:

- **Environmental protection:** South Australian environmental regulations consider waste to energy to be a waste treatment and disposal process, because energy is not considered a "product". To avoid paying the solid waste levy for all waste received, proponents wanting to establish facilities for the production of energy alone will likely require an exemption from the South Australian Environmental Protection Authority, as costs compared to landfill would render waste to energy uneconomic.
- **SA Waste Strategy and ZWSA Act:** Provides South Australian Government with a strategic direction and focus on how to reduce solid waste being sent to landfill and advocates the use of the Waste Management Hierarchy.
- **EPA Solid Waste Levy:** this levy applies to waste disposed at landfill sites and provides a financial incentive to divert waste from landfill.
- **Australian Government Carbon Price Mechanism:** this is Australia's emissions trading scheme which commenced on 1 July 2012. Landfills that emit 25,000 tonnes or more of CO_2 equivalents per year are liable under the scheme (i.e. are required to have carbon permits to continue emissions). This provides an incentive to divert organic waste from landfill.
- **Australian Government Carbon Farming Initiative:** this voluntary scheme aims to generate carbon credits and greenhouse gas reductions, which may provide a financial incentive to develop waste to energy facilities.
- **Australian Government Renewable Energy Target:** this target provides a financial incentive for the development of waste to energy facilities that export electricity to the grid.

Key considerations in developing this waste to energy interim policy position paper included:

- impacts of sparsity and scale for collecting waste feedstock
- waste management and energy hierarchies
- performance of resource recovery and renewable energy sectors
- impacts of legislation
- market value of products and materials
- South Australian commitments to greenhouse gas reductions
- South Australian Renewable Energy Targets.

The ZWSA interim policy positions below will be used as a basis for consultation with stakeholders and other Government agencies to develop a South Australian Government policy position on waste to energy.

Policy Position 1: Sustainable development – a holistic approach

Waste to energy infrastructure must support the development of South Australia by maximising the economic, environmental and social benefits of waste and energy management, as well as support State Government objectives and targets.

Policy Position 2: Market-based approach

Market-based approaches should be used to drive economic and environmental benefits associated with waste to energy facilities.

Policy Position 3: Robust business case

Waste to energy proposals should be accompanied by a robust and transparent business case.

Policy Position 4: Higher value products from waste

Support higher value products from waste materials and through value add, maximise the economic development opportunities associated with the recovery of waste resources.

Policy Position 5: Multiple environmental and social benefits

Preference for waste to energy plants to provide multiple environmental and social benefits.

Policy Position 6: Technology assessment

Align waste to energy technologies with suitable and reliable feedstock.

Policy Position 7: Transitioning industry

Support the transition of the resource recovery sector in South Australia to build its capabilities in waste to energy and capitalise on the business opportunities associated with producing higher value products from waste resources.

Introduction

South Australia is recognised internationally for its leadership in resource recovery and renewable energy.

Waste to energy brings these two areas together to provide new development opportunities for South Australia which include:

- increasing the market value of waste resources and materials
- reducing greenhouse gas emissions
- reducing waste management costs for the community and business
- increasing renewable energy generation
- increasing energy security through embedded energy generation
- reducing waste resources sent to landfill.

South Australia's Waste Strategy 2011-15 recognises the need to support new technologies that enhance performance, increase the value of waste resources and/or replace landfill disposal, consistent with the waste hierarchy.

Zero Waste SA (ZWSA) in addition to Renewables SA[1], is receiving a growing number of enquiries related to waste to energy. The development of a South Australian Government position on waste to energy will provide more certainty for investment and help address community concerns.

This Interim Consultation Position Paper on Waste to Energy (Interim Position Paper), in combination with the Waste to Energy Background Paper[2], provides a platform for ZWSA to commence dialogue with stakeholders and other relevant Government agencies with the aim of developing and securing endorsement to formulate a State Government position on waste to energy.

CITY REFUSE DESTRUCTOR

On 20 June 1910, Adelaide City Council's Refuse Destructor commenced operations in Halifax Street. The Refuse Destructor incinerated the city's and inner suburb's waste through two furnaces. The heat from the furnaces was used to boil water which powered other buildings and plant on the site. Surplus power was sold to the Adelaide Electric Supply Company (now known as SA Power Networks). This method of disposal was used until May 1954 – since then the city's waste has sent to Wingfield landfill.

Source: *Heritage of the City of Adelaide, Corporation of the City of Adelaide, 1990*

ANAEROBIC DIGESTION STRATEGY AND ACTION PLAN

"In addition to generating energy, AD [anaerobic digestion] produces digestate. This is a valuable bio-fertiliser that can be used as a renewable s ource of critical resources such as nitrogen and phosphorus. The nutrient composition of the digestate depends on the feedstock, but generally speaking, the digestate that is produced will contain the nitrogen, phosphorus and trace elements that are fed into the system in the feedstock"

(Anaerobic Digestion Strategy and Action Plan, Department of Environment, Food and Rural Affairs, UK, 2011).

[1] *Renewables SA is part of the South Australian Department of Manufacturing, Innovation, Trade, Resources and Energy*

[2] *Waste to Energy Background Paper (Ricardo-AEA, 2013)*

Objectives and Scope

The purpose of this paper is to provide a consultation draft to commence a dialogue with relevant stakeholders and State Government agencies with the intent of developing a South Australian Government policy position on waste to energy.

Objectives

The main objectives of the waste to energy interim position are to:

- update the waste to energy policy position of the Board of Zero Waste SA;
- provide a more holistic approach to waste to energy to drive optimal environmental, social and financial outcomes; and
- help correct distortions in the market in relation to the development of waste to energy facilities.

Scope

This Interim Position Paper addresses solid and liquid wastes. The following forms of waste to energy are covered within the scope:

- traditional thermal combustion of waste;
- advanced thermal combustion of waste;
- capture and combustion of bio-gas from the breakdown of organic wastes in landfill;
- capture and combustion of bio-gas from the biological or bio-chemical treatment of waste (e.g. anaerobic digestion); and
- conversion of waste to a fuel (e.g. transport fuels).

The following waste treatment technologies and processes fall outside the scope of this paper:

- treatment of hazardous waste;
- thermal combustion of waste without energy recovery;
- thermal treatment of contaminated soils; and
- composting.

Policy and Regulations

Environmental Protection

In South Australia there is no specific legislation on waste to energy, however waste to energy facilities must be licenced by the Environment Protection Authority. Waste to energy is considered waste treatment and disposal under the South Australian *Environment Protection Act 1993*. Any energy recovery is considered a secondary purpose. The same applies to biogas from anaerobic digestion or from wastewater treatment facilities. As a waste treatment and disposal depot, the waste levy would apply to waste to energy plants although the Environment Protection Authority can issue an exemption

South Australian Waste Strategy and ZWSA Act

The South Australian Waste Strategy (2011-15) establishes a strategic direction and focus for solid waste management in South Australia. The Waste Strategy advocates the use of the Waste Management Hierarchy and allocates waste to energy in the 'Recovery' section. The Zero Waste SA Act (2004) establishes a State Government agency (ZWSA) which draws on part of the solid waste levy to support resource recovery and recycling in the state.

Solid Waste Levy

The solid waste levy applies to waste disposed at landfill sites. The *Environment Protection Regulations 2009* falls under the *Environmental Protection Act 1993* and requires all premises that receive, store, treat or dispose of waste (e.g. waste depot) to be licensed by the Environment Protection Authority and pay the waste levy for all waste received. The levy is collected on behalf of the South Australian Government and a portion is used to fund resource recovery and waste minimisation programs. Current levies on solid waste are:

- for a non-metropolitan landfill $23.50 per tonne
- for metropolitan landfill $47 per tonne.

Australian Government Carbon Price Mechanism

The Carbon Price Mechanism (CPM) is Australia's emissions trading scheme which commenced on 1 July 2012. The scheme is regulated by the Clean Energy Regulator and overseen by the Climate Change Authority. Sites and facilities that emit over 25,000 tonnes of CO2 equivalents per year will be liable under the CPM. Note that emissions attributable to the combustion of biomass, biofuel or biogas are not included under the scheme.

During the first stage of the CPM (2012-13 to 2013-14), the price of carbon permits will be fixed at $23, increasing by 2.5% each year until 2014-15 when the price will be set by the market. During this period, liable organisations will be able to purchase permits at the fixed price or purchase credits under the Carbon Farming Initiative. The second stage of the CPM will start in July 2014 and will move from a fixed price system to a 'cap and trade' scheme whereby a fixed number of permits will be issued to each sector by auction, and liable organisations will be able to trade permits. Operators of landfills emitting over 25,000 tonnes CO2 equivalent per year are liable under the CPM. This equates to landfills accepting more than about 30,000 tonnes of municipal waste per year. Waste which was landfilled prior to July 2012 (legacy waste) is not covered by the scheme. Emissions from the recovery of landfill gas do not incur a liability.

Australian Government Carbon Farming Initiative

The Carbon Farming Initiative (CFI) is a voluntary Australian Government carbon offsets scheme. It aims to help farmers and land managers earn additional income from reducing emissions (such as nitrous oxide and methane) and sequestering carbon in vegetation and soils through changes to agricultural and land management practices.

Approved methodologies for CFI currently include capture and combustion of landfill gas, destroying methane from piggery manure, environmental plantings and reducing savannah burning. However, further methodologies are under consideration.

Waste to energy technologies may be able to generate CFI credits. An Additionality Test is used to determine whether a greenhouse gas reduction activity would have occurred without the carbon price. If an activity is deemed additional, it can be accepted under the CFI and/or CPM scheme. It is important to note that while there may be opportunities in the future to claim CFI credits with waste to energy facilities, it has been determined by the Australian Government that composting is not considered additional.

Australian Government Renewable Energy Target

The Renewable Energy Target (RET) Scheme is legislated under the Australian Government's *Renewable Energy (Electricity) Act 2000* and the *Renewable Energy (Electricity) Regulations 2001*. The RET was introduced to drive investment and innovation in renewable energy. The RET provides a financial incentive for the development of waste to energy facilities (considered renewable energy when using organic waste) that export electricity to the grid.

Technologies

Waste to energy technologies fit into three main categories: conventional combustion, anaerobic digestion and advanced thermal.

Conventional Combustion

Conventional combustion incinerates wastes to produce heat energy which can be used directly or converted to electricity. Internationally, conventional combustion is well established. There are three types commonly used:

- moving grate
- fluidised bed
- rotary kiln.

Conventional combustion for waste to energy is not currently used in South Australia although there has been interest to capture the energy from the incineration of medical wastes.

Anaerobic Digestion

Anaerobic digestion involves the conversion of biodegradable organic matter to energy by microbiological organisms in the absence of oxygen. The biogas produced in the process is a mixture of methane and carbon dioxide, and can be used as a fuel source for heating and/or electricity production. The treatment of waste leaves behind residues, generally in the form of semi-solid or liquid called digestate that can be used as a soil conditioner. In South Australia, SA Water own and operate anaerobic digesters to treat wastewater and use the electricity on site.

More advanced anaerobic digestion uses thermophilic bacteria, rather than the traditional mesophilic bacteria. Thermophiles operate in a higher temperature range similar to their aerobic relatives that are used to produce compost. By regulating the temperature (keeping it at a level suitable for thermophiles), the performance of the anaerobic digester is enhanced through increased methane production and removing more carbon from the digestate which produces a high value liquid fertiliser.

Capturing and combusting biogas generated by the anaerobic breakdown of waste organics can also be facilitated at landfill. Many large landfills in South Australia capture and combust methane and produce electricity and in some cases, export the electricity to the grid.

Advanced Thermal Technologies

Gasification, plasma gasification and pyrolysis are the main forms of advanced thermal technologies.

Gasification is the process of converting solid or liquid waste into a partially oxidised gas, known as 'syngas' – a combination of carbon monoxide and hydrogen. Typical temperatures required for gasification range between 500-1800°C. Syngas can be used in a number of ways, including combustion in an engine, boiler or for conversion into a transport fuel.

Plasma gasification is the term that applies to a range of technologies that involve the use of a plasma torch or arc. Plasma is an electrically conductive gas, such as nitrogen or argon, which is heated by an electrical current to very high temperatures (7,000°C). The plasma torch can be applied directly to the feedstock, or to the syngas produced by a preceding gasification process to recover energy.

The torch can be applied to inorganic materials, which are melted into a liquid slag and then cooled into a solid. The higher temperatures ensure that the syngas produced by a plasma process is cleaner than conventional combustion, as the higher temperatures allow for the breakdown of tars. Whilst the syngas can be used for energy utilisation, the plasma process itself has a high electricity consumption.

Pyrolysis is similar to gasification except that the feedstock is thermally degraded in the complete absence of oxygen. Conventional pyrolysis takes place in temperatures ranging between 400-900°C. Slow pyrolysis is characterised by low heating rates and long residence times, whereas fast pyrolysis is characterised by very high heating rates and short residence times. The design of the pyrolysis process will impact on the characteristics of the process outputs. For example, slow pyrolysis will produce charcoal, oil and gas, whereas fast pyrolysis is designed to maximise the production of pyrolysis oils.

Key Considerations

In formulating this Interim Position Paper for consultation, there are a range of factors that should be considered – especially in the context of waste and energy management in South Australia.

HIDDEN MARKET VALUE OF WASTE ORGANICS

The potential market value of organic waste was estimated by comparing the value of carbon as an energy source with the nutrients required to produce a high quality fertiliser.

Estimations where based on a financial return for carbon of $150 per MWh of electricity generated (Australian Greenhouse Accounts Factors, July 2013) and $847 for a tonne of wide spectrum fertiliser (Great Western Mining Fertiliser Price List, 2013) for carbon and nutrients. Estimates excluded micro-nutrients.

The potential value of carbon was $146 per tonne compared to nutrients which was $1943 per tonne. These values reflect the upper limits in financial returns and it does not consider capital and operational expenditure.

Based on the analysis commissioned by the NSW Government, poultry litter consisted of 41% carbon and 9.4% nutrients. The potential value of the carbon was just under $60 per tonne and the nutrients were $186 per tonne. For poultry litter, the value of the nutrient content is over three times the value of carbon.

While these figures are indicative, it demonstrates that the current focus on carbon is not capitalising on the hidden value locked within organic waste – the nutrients.

Sparsity and Scale

Population and economic activity directly influence the amount of waste generated. Compared to the eastern states of Australia and most developed countries internationally, South Australia is relatively small in terms of population. Most waste to energy technologies requires large amounts of waste feedstock to be feasible. Given the throughput of waste to energy plants in Europe, it is unlikely that similar scales exist in South Australia.

Due to the high costs of transport, issues of scale become more apparent when waste generation is sparsely distributed across an area. Higher density living and more concentrated economic activity such as residential apartments and industry clusters respectively, are more likely to overcome the scale issue and provide more opportunities for waste to energy in the future.

Waste Management and Energy Hierarchy

The Waste Management Hierarchy is recognised internationally as an effective approach to managing waste resources. It advocates waste avoidance and reduction before reuse and recycling which in turn, is more preferable to recovery and disposal. Waste to energy is usually allocated in the ‘recovery’ level (i.e. recovering the energy from waste).

The Energy Hierarchy is very similar to the Waste Management Hierarchy and follows the same principles in terms of preferred approaches to energy management. The Energy Hierarchy advocates reduction and efficiency before energy generation. Energy generation is divided into three areas: renewable; low emission; and conventional energy generation (i.e. preference is based on the greenhouse intensity of energy generation options).

Figure 1 below compares the Waste Management and Energy Hierarchies with the sections in shaded grey indicating where waste to energy is allocated.

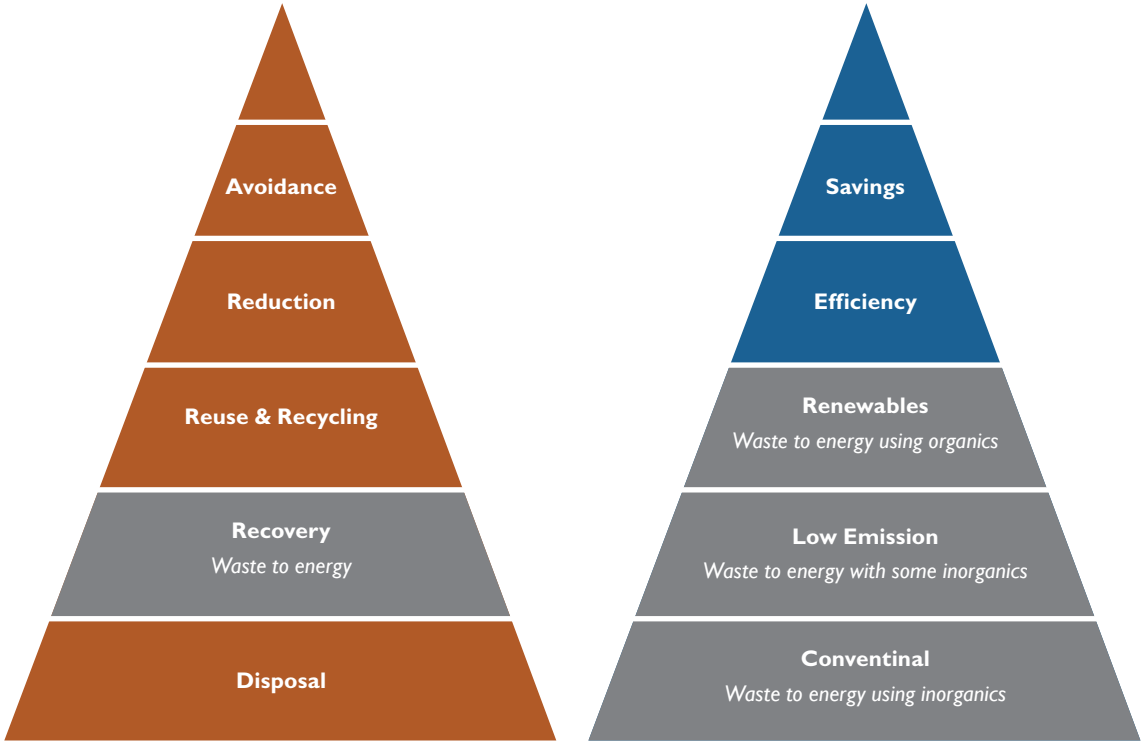

Figure 1. Alignment of the Waste Management Hierarchy and Energy Hierarchy – waste to energy can be allocated to the grey sections in each hierarchy.

Performance

South Australia has the highest resource recovery rate than any other State in Australia and Adelaide is considered one of the highest performing cities in the world[3]. Given the strong recycling performance of South Australia, opportunities for waste to energy are likely to focus on residual waste (waste remaining after high value waste materials have been extracted). However, should waste to energy facilities generate a higher financial return than recycling, the market will drive investment towards energy recovery.

Legislation

In Europe and Japan, legislation has historically driven the development of waste to energy facilities. This has not been the case in South Australia where environmental regulations are guided by the Waste Management Hierarchy. The Objective of the Environment Protection (Waste to Resources) Policy states:

"The objective of this policy (the waste management objective) is to achieve sustainable waste management by applying the waste management hierarchy consistently with the principles of ecologically sustainable development set out in section 10 of the [Environment Protection] Act".

South Australian environmental regulations do not consider the energy generated from waste to energy plants as a product. Therefore, waste to energy plants that generate energy alone would be classified as a waste disposal depot which may attract the waste levy. This can be avoided by complying with the Refuse Derived Fuel Guideline or producing a soil conditioner (as a by-product). The Environment Protection Authority also has the powers to exempt sites from the waste levy. The regulations in South Australia provide flexibility to allow waste to energy plants under certain conditions. However, this can also impact on investment certainty which may inhibit the development of waste to energy plants in South Australia.

3 Solid Waste Management in the World's Cities (UN HABITAT, 2010)

Market Value

The development of waste to energy facilities in South Australia are more likely to be driven by the market rather than regulations. With the increases in energy prices in South Australia, the investment profile of waste to energy facilities will be more positive. Waste to energy plants can also support embedded or decentralised energy generation which can help defer investment in electricity infrastructure augmentation.

A significant development over the past decade has been the rapid increase in global fertiliser prices. Fertiliser manufacturing is a highly energy and greenhouse gas intensive process. Increases in energy costs places upward price pressures on fertiliser costs. Additionally, market concerns related to the scarcity of global phosphate reserves has introduced volatility in the global fertiliser market.

Global wholesale fertiliser prices have risen almost 250% in the last decade and this upward trend is continuing. Given that organic waste contains nutrients, there is likely to be growing interest in converting organic waste to fertiliser. This presents an opportunity, given that anaerobic digestion is the only waste to energy technology that produces renewable energy in addition to a producing a liquid and/or solid bio-fertiliser. Producing both renewable energy and fertiliser will improve financial feasibility of waste to energy projects (see Box 3).

Greenhouse Gas Emissions

Greenhouse gas emissions are produced when organic waste breaks down anaerobically in landfill. Diverting waste organics from landfill (to be composted or converted to energy) results in greenhouse gas emissions reductions[4].

Greenhouse gas emissions from landfill can also be reduced (by up to 85%) by capturing and combusting methane to produce renewable energy. There are several landfill sites that produce energy from landfill gas in South Australia.

The combustion of inorganic waste releases greenhouse gas emissions. Unlike greenhouse gas emissions from organic waste, combusting inorganics results in a net increase in emissions. Energy from waste tyres and plastics has similar greenhouse gas intensity as a coal-fired power station.

The South Australian Government has committed to ambitious greenhouse gas reduction targets and was the first jurisdiction in the world to establish climate change legislation.

South Australian Renewable Energy Targets

Associated with South Australia's greenhouse gas reduction commitments, the deployment of renewable energy is also a high priority for the State. South Australia has committed to a 33% reduction target by 2020.

South Australia's global leadership in the deployment of wind energy has been recognised internationally and other forms of renewable energy such as waste to energy would contribute to South Australia's renewable energy targets.

4 The International Panel for Climate Change discriminates between inorganic and organic materials in greenhouse gas accounting. Composting or combusting organic waste produces carbon dioxide but because the carbon has recently been sequestered (through the photosynthesis of plants) from the atmosphere, emissions have no impact.

Interim Positions

Overview

Figure 2 provides an overview of the processes and stages for waste resources to be used for waste to energy.

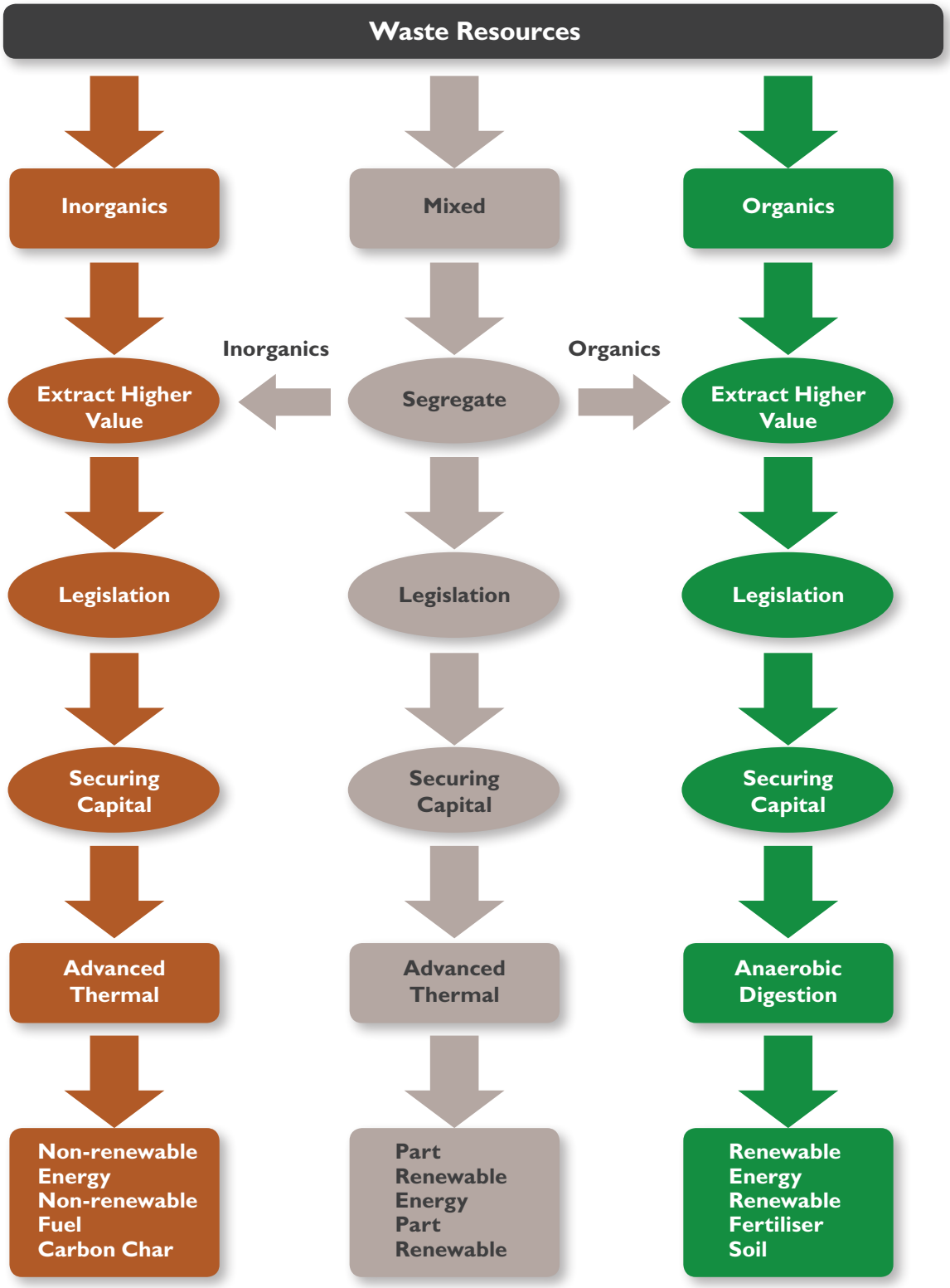

Figure 2 - Waste to Energy Development Process

The Waste to Energy Development Process combines the Waste Management and Energy Hierarchy which reflects the extraction of higher value materials from waste resources and the preference for low emissions energy generation.

The following interim policy positions have been developed by ZWSA. These are intended to be the framework for initiating dialogue with stakeholders and other State Government agencies to develop waste to energy policy for South Australia.

Policy Position 1: Sustainable development – a holistic approach

Waste to energy infrastructure must support the development of South Australia by maximising the economic, environmental and social benefits of waste and energy management, as well as support State Government objectives and targets.

Waste to energy facilities in South Australia will align and contribute to South Australia's Strategic Plan 2012, South Australia's Waste Strategy 2011-15 and the Tackling Climate Change: South Australian Greenhouse Gas Emissions Reduction Strategy (2007). Undertaking a holistic approach in the planning, design and development of waste to energy infrastructure will help maximise the economic, environmental and social outcomes and assist with aligning it to other Government policies.

An important part of sustainable development is resource conservation. Waste to energy facilities can provide renewable energy which reduces energy generation from fossil fuels (such as coal, oil and natural gas). Recycling of waste materials also reduces the demand for primary resources which includes metals, organics, fossil fuels, fertilisers, soil and cement. The economic value of preserving primary resources is not well represented in the marketplace and by applying and integrating life cycle and indirect economic analysis, the risks associated with diminishing resources can be better understood and will support more informed decision making processes.

Policy Position 2: Market-based approach

Market-based approaches should be used to drive economic and environmental benefits associated with waste to energy facilities

There are financial incentives such as the Australian Government's CPM and the solid waste levy which encourage greenhouse gas reductions and diverting waste from landfill. These price signals provide a financial threshold or upper limit whereby a vibrant market is developing. This approach combines both regulatory and market-based mechanisms to achieve environmental outcomes but also economic development opportunities. It also allows the preferred outcomes in the waste management and energy hierarchies to be supported and driven by market forces.

Policy Position 3: Robust business case

Waste to energy proposals should be accompanied by a robust and transparent business case

The Waste to Energy Background Paper highlights the contrasting policy and regulatory environmental between Europe and South Australia. To comply with European Directives, waste to energy plants are generally used to minimise compliance costs. In South Australia, waste to energy plants will require a strong business case to attract investment. It is interesting to note that currently there are 19 new advanced thermal waste to energy plants in UK that have received planning and environmental approval, but development has stalled due to the lack of private investment[5].

5 Adam Read, Ricardo-AEA, Energy from Waste Webinar (WMAA, 2013)

Policy Position 4: Higher value products from waste

Support higher value products from waste materials and through value add, maximise the economic development opportunities associated with the recovery of waste resources

Waste resources should be directed towards processing that yields the highest market value and provides the most environmental benefits. It is recognised that waste to energy will need to compete in the marketplace for waste feedstock as will other users of waste organics such as composting, mulching and animal feed. Relying on market forces to attain an optimal outcome may be inhibited by market failures – especially information asymmetries[6]. State Government has an important role to help correct the market failures.

The market value of recovered waste materials can be increased through sorting, processing, integrating with other materials and re-manufacturing. Adding value to a waste material provides economic benefits through industry development, encouraging innovation, employment growth and providing investment opportunities. In terms of value-add, there is an opportunity for waste to energy to reduce the residual (waste after sorting and separation) which currently goes to landfill.

The economic value of by-products from waste to energy is an important factor in increasing the value of waste materials. For example, advanced thermal technologies can produce an 'agri-char' or carbon fibre which can be added to productive soils, and anaerobic digestion can produce renewable fertilisers and soil conditioners. However, contamination of waste resources significantly reduces the opportunity to value-add, highlighting the importance of separating waste resources at the source.

Policy Position 5: Multiple environmental and social benefits

Preference for waste to energy plants to provide multiple environmental and social benefits

Waste to energy provides environmental and social benefits in terms of greenhouse gas reductions, resource recovery, employment growth (ie when including industry development) and energy security. Other environmental and social considerations should also be taken into account such as air quality, water conservation, wastewater management, noise, traffic, human health, biodiversity and loss of amenity. Managing community concerns and expectations is critical. Targeted engagement and consultation will help alleviate community concerns.

Demonstrating community support for the development of waste to energy proposals is likely to have a positive influence on investors. Waste to energy developments should incorporate a community communications and engagement plan within the proposal and business case.

Policy Position 6: Technology assessment

Align waste to energy technologies with suitable and reliable feedstock

While waste to energy facilities can be segregated into three main categories, there is a wide range of technology options within these groups. It is important to align the waste feedstock with the appropriate technology. For example, anaerobic digestion can only recover energy from organic material. Advanced thermal technologies such as gasification, have been highly successful when the waste feedstock is homogeneous but not as successful if the feedstock is mixed waste. One of the most successful gasification plants that use mixed waste as feedstock is in Finland[7] but the plant requires extensive pre-treatment through a mechanical biological treatment. This impacts the investment profile of the technology.

6 Information asymmetry is a market failure that occurs when one market participant has more and/or better information than another.

7 Waste to Energy Background Paper – Case Study 1 (Ricardo-AEA, 2013)

Policy Position 7: Transitioning industry

Support the transition of the resource recovery sector in South Australia to build their capabilities in waste to energy and capitalise on the business opportunities associated with producing higher value products from waste resources

Waste to energy provides new opportunities for industry development in South Australia. There are businesses such as composters that State Government has supported to ensure that industry has the capacity to divert waste from landfill. Waste to energy will provide competition with existing resource recovery practices such as composting. There are opportunities to help transition the existing industry and build its capabilities to extract greater value of waste materials. For example, given the expertise of the composting industry in managing waste organics, anaerobic digestion (which can produce a high quality fertiliser in addition to renewable energy) could increase the value of waste derived products.