ENERGY FROM WASTE SUSTAINABILITY PROJECT

NOTES FROM THE BRISBANE STAKEHOLDER WORKSHOP

Held: Thursday 7 November 2002

Time: 9.00 am until 12.00 pm

Venue: Hilton Brisbane

190 Elizabeth Street, Brisbane

For more information on the Energy from Waste Sustainability Project please visit the project website:

www.wmaa.asn.au/efw/home.html

Or contact the Project Manager,
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This project is an initiative of the:

Energy from Waste Division of the
WASTE MANAGEMENT ASSOCIATION OF AUSTRALIA

Commonwealth Government funding through the Australian Greenhouse Office supports this project.

AUSTRALIAN Greenhouse Office

Introduction

There are a number of issues and concerns associated with energy from waste projects. On the positive side, recovering energy from waste can generate renewable electricity, reduce the amount of waste disposed of to landfill and reduce greenhouse gas emissions. However, there are also potential negative environmental and human health effects associated with energy from waste projects.

The Energy from Waste Division of the Waste Management Association of Australia, with assistance from Commonwealth funding through the Australian Greenhouse Office, initiated the process of developing a Sustainability Guide to resolve these issues. Part of this process was a national series of eleven stakeholder workshops.

The purpose of the stakeholder workshops was to ensure that all of the positive and negative factors associated with Energy from Waste (EfW) projects were identified. The intention being to incorporate them into a Sustainability Guide for EfW. It is intended that the Guide will be used to ensure that Energy from Waste projects maximise benefits and minimise negative impacts in a way that supports the sustainable development of Australian society.

Below are the issues that were identified at the Brisbane Stakeholder Workshop. These issues will be integrated into a final report, representing all of the issues raised by workshop participants at this and the other ten national workshops.

The issues identified at the workshops will be used as a "yardstick" against which the Sustainability Guide will be measured, both to ensure that all issues have been addressed in the Guide, and to ensure that the philosophical basis of the Guide is correct.

Round Table Discussion

There were 32 participants at the Brisbane Stakeholder Workshop. (A participant list is included as Appendix 1). Participants were seated around five tables to discuss issues related to Energy from Waste. The summary of the discussion from these five tables was recorded onto over-head-transparencies and is presented below exactly as scribed.

A catalogue of the issues recorded by participants onto flash-cards is included as Appendix 2. These issues are also presented exactly as scribed. The colour of the flash-cards was used to differentiate between tables.

Orange Table

1. COMMUNITY
    - Education/Acceptance
    - Negative view
    - Stakeholder Interests
2. PHILOSOPHICAL/SUSTAINABILITY
    - Does EfW meets sustainability targets
    - Should EfW be bottom of hierarchy?
3. ECONOMIC
    - Costs to technology provider.
    - Cost to community
        - lifecycle
4. ENVIRONMENT
    - Renewable energy
    - Pollution
5. TECHNOLOGY
    - Expensive/ability to pay
    - Appropriate
6. REGULATION
    - Need for effective legislation to change system
    - Control system
7. IMPLEMENTATION
    - Geographical
    - Cultural change
    - Timing/phase-in

Red Table

1. ECONOMIC
    - Regulatory
        - Identify responsibility and remove impediments
    - Market based instruments
        - Resource brokering.
2. ENVIRONMENTAL
    - Scope to include waste to energy in broader environmental programs.
    - Emissions – risk
        - Air
        - Water
        - Residual wastes
    - Creating waste to supply technology rather than waste driving technology.
    - Quality of feedstock.
3. PUBLIC/COMMUNITY
    - Public perception of waste
    - "Not in my backyard"
    - Public education
    - Regional solutions to meet regional conditions
4. MANUFACTURE
    - Product design (regulation)
    - Extended producer responsibility
5. TECHNOLOGY
    - Competing technologies
        - How to choose
    - Competing waste industries and political lobbying

Purple Table

1. COMMUNITY ISSUES
    - Does EfW = Incineration?
2. AIR EMISSIONS
    - EfW emissions should be same as other industries
        - Dioxins – acceptable level by comm.???
        - Emissions measurement?
    - EPA's must be consistent in imposed levels
    - Overall net benefit of emissions
3. LANDFILL VERSUS EfW
    - Lack of landfill space
        - There is no lack of space
    - Is landfill bad?
    - Landfill levy
4. COSTS
    - Externality costs
    - Remote locations
    - Alternative landfilling
        - Store for future generations
    - Security of investment
    - How much is community willing to pay?
    - LCA
5. EfW versus OTHER ALTERNATIVES
    - Waste hierarchy
    - Nutrient benefits of EfW versus others
6. POLITICAL INTERVENTION
    - Politicians versus council officers versus $$$

7. BENEFITS OF EfW
    - Renewable energy from waste versus soil carbon from waste
    - Renewable energy from waste versus other clean power generation
    - Purpose grown biomass EfW versus EfW of waste
    - 100% energy generated from waste should be green

Green Table

1. BEST FUTURE USE EVALUATION
2. MARKET
    - Supply (A)
    - Demand (B)
3. COMMUNITY ACCEPTANCE AND COMMITMENT
4. TECHNOLOGY AND PRACTICE
5. R&D AND VERIFICATION/VALIDATION
6. LAND USE – REHAB. AND ENERGY HARVEST

Blue Table

1. ECONOMICS
    - Life cycle costs
    - Technology driven rather than needs driven
    - Competition in the market place
    - Priorities for support funding
    - REC type scheme required
    - No current economic incentives (tipping charges)
    - Regional development
    - High capital cost of plant
2. ROLE OF GOVERNMENT
    - KYOTO
    - Lack of legislation

- Lack of leadership
- Government incentives

3. SOCIAL ISSUES
    - NIMBY
    - Local employment opportunities
    - Poor public image
    - Lack of public understanding
    - Seen to be clean and green by some
4. TECHNOLOGY ISSUES
    - Potential conflict for use of resources
    - Tyres??
    - Energy storage (gas)
    - Coal wastes qualify for GECs?
5. ENVIRONMENTAL ISSUES
    - Forest thinings
    - Need wastes
    - Local air quality
    - GHG's (credits?)
    - Liquid and solid wastes
        - Leachate
    - Stabilisation of ash, char.
    - Sustainable use of materials
    - Fugitive gases

Results of Citizen's Jury

These are listed in the table below.

Table	***Strongly No*** EfW has **no** role to play in any form	***Contingent*** EfW has a role to play but that role is determined on case by case issues	***Strongly Yes*** EfW **always** has a role to play in any form
Orange	0	7	0
Red	0	3	2
Purple	0	2	3
Green	1	<-1 3->	<- 1
Blue	0	6	0
Totals	1	22	6

General comments from the tables regarding energy from waste

Orange Table

No comments.

Red Table

No comments.

Purple Table

- It is hard to imagine achieving resource recovery desires of community without an energy component

Green Table

No comments.

Blue Table

No comments.

Appendix 1 – Brisbane Workshop Participants

Name	***Organisation***
Murray Allan	Collex
Sean Barnes	Advanced Wastewater Management Centre
Bob Blattman	
Anne Braithwaite	Beaudesert Shire Council
Brian Clark	Queensland Conservation Council
Michael Clarke	Griffith University
Sharon Denny	Office of Energy
Stuart Dix	E3 International
David Downing	PB Power
Martin Gellender	QLD EPA
Mark Glover	Renewed Fuels P/L & Chairman of the Energy from Waste Division
Peter Goggin	PEG Business Solutions
Bob Holle	Collex
Fenn Hughes	Brisbane City Council
Kylie Hughes	QLD EPA
Toby Hutcheon	Ecomatters
Des Jones	QLD EPA
Elisha Keighley	Bris City Council
Peter Lehmann	Treeco Pty Ltd
Nicholas Lindsay	Office of Energy
Andres Maasing	Energy Developments
Nigel Martin	QLD EPA
David Mills	Office of Energy
David Moy	TechSearch
Bob Omidvar	PB Power

Name	***Organisation***
Bob Pagan	University of Queensland
Graeme Philip	Thiess Services
Don Prentis	E3 International
Paul Russell	Aust Industry Group
Paul Smith	Waste Solutions
Wayne Vaughan	SITA Environmental Solutions
Matthew Warnken	Warnken I.S.E. P/L - Project Manager and Workshop Facilitator

Appendix 2 – Catalogue of Issues Identified at the Brisbane Workshop

Note: 'xxx' implies that it was not possible to read a word/words on a submitted card, the superscript is for archival reasons to assist the workshop organisers.

Orange Table

- (negative) The geographical dispersion (and relatively small scale by world standards) of waste generating industries in QLD/AUST. casts a doubt over project economics.
- Issue
    - Type of waste to energy facility
    - Incineration pyrolysis
    - Bioreactor, anaerobic digestion

  Commercially, politically, sociologically, anaerobic digestion in a purpose built in ground facility stands out as a preferred method.
- EfW technologies do not provide 'better' solutions above existing.
- There will always be residual waste after recycling
    - Better to extract energy
- Byproducts
    - Ethanol
    - Organic acids
    - Solid residues as fertiliser
- Separation (at source)
    - Major issue especially contamination
- Use of valuable (potentially) materials for inappropriate uses
- Difficulty in sorting waste stream
    - How costly?
    - How effective?
- Appropriateness to achieve regional goals/commitments
- Lack of community support for waste schemes/community perception
- Local communities will not accept facilities
- (negative) community opposition NIMBY syndrome

- NIMBY
    - No-one wants to live near a WTE or a landfill facility
- Distributed pollution issues, difficult to control
- Atmospheric pollutants from thermal combustion
    - Can we truly guarantee that "nasties" are not released?
    - Given the history of combustion, can we get public confidence?
- Regulatory drivers
- (negative) lack of a spirit of co-operation between local governments to solve waste reduction
- Driving force through policy or regulation (not just leaving it to industry)
- (negative) regulatory barriers
    - i.e. stringent licensing regime on transport, storage and treatment regulation /hay wastes
    - Too hard to get approvals!
- Lack of knowledge of SI
- (negative) low level of awareness of alternative technologies (cost/benefits?)
- There are proven and better solutions than EfW
- EfW produced a problematic ash
- Research
    - Activity encouragement of added knowledge not just accepting current state of affairs.
- Lack of complete life cycle information on all wastes/technologies
    - Lack of decision support mechanisms to choose between optimal uses.
- Issue
    - Type of waste to energy technology
- Technology must stand up politically, sociologically and economically
- Anaerobic digestion by way of a purpose built in ground facility meets all these critical areas.
- (negative) lack of industry commitment to sustainable practices. Need to demonstrate the business case i.e. cash benefits

- Lack of sustainability focus
    - Maybe trying to greenwash the concept.
- Waste prevention/clean production
    - Stopping waste
    - Life cycle analysis
- (positive) contribute to renewable energy targets
- (negative) it is till relatively cheap for industry/waste generators to dispose of waste streams (compared to EU)
- More economic development and job creation in recycling and not closing off the options.
- Cost
    - Especially for waste sorting
    - Economic pressure
        - Lowest cost solution rather than best solution
- Encouraging non-sustainable production of waste - especially in waste is purchased.
- Cost
    - Reflection of true costs of waste treatment
    - Full lifecycle costing
- Which technology can manage waste variables (eg. volumes, contaminated levels) most effectively?
    - KISS
    - The bioreactor
- Technologies are there/economics will drive it
    - Change management
    - Distance
    - How to assist industry/government to make sure energy waste streams go to an appraised technology that is social/economical/environmentally accountable
    - eg. Phasing in period to direct current waste streams to an approved facility.

- Project scoping principles sound good in theory but are they practical?
    - eg. Determining "best use" of a material on what is best use?
        - How can we ensure materials to go to their best use?
- Segregation of energy valuable waste streams

Red Table

- Public
- Increasing urbanisation resource concentration without resource return
    - Resources -> into city -> no return -> resources…
- Public perceptions of outputs
    - Treated water waste
- Education, awareness and public perception
    - NIMBY
- Whose backyard?
    - Concept awareness
    - Education
    - Safety (hazard and risk management)
- Opportunities for regional development as markets are established for waste where other recovery markets don't exist.
- Requirement for rigorous assessment criteria in determining what is best use of the "resource"
- (positive) Paradigm-shift
    - Change public perceptions of the waste management cycle
    - Provide alternative
    - Educate on alternatives
- Economic
- Develop market-based instruments for waste to energy (fuel market/environment benefit)
- Resource brokering
    - MSW as a resource to be brokered.

- (positive)
    - Monetise/incentivise
        - The shift in waste production
        - Waste management
        - By-product usage
- Removing impediments to introduction of waste technologies, including "level playing field" for costs.
- Regulators
    - Costs of delineation of responsibility
- Manufacture and R&D
- Product design
    - Biodegradability
    - *MSW geared to kerbside collection
    - Alternative on-site treatment
- Who will regulate product design
    - Global market import controls
    - Political will-power
- Environmental
- (positive) look to integrate systems
    - Include waste to energy in a broader community/environment initiative (eg. land degradation, water conservation and quality)
- Air pollution
    - Emissions from waste to energy significant risk
- Creating waste to create energy
    - Avoidance first
- Separation
    - Costs
    - Optimising feedstock and reuse/recyclables
- Technology

- How is the "highest" and best user determined
    - What does this mean in real terms?
- Selfsustained energy systems to replace say sewage systems
    - Council could give a reduction in rates.
- Small-scale waste management EfW
    - Home based
    - Distributed electricity benefit
    - Water recovery
    - Waste disposal
    - Sustainable
- Competing waste industries and political lobbying.
- Technology time lines
    - Still innovative
    - State of the art to state of the ark
- Competing technologies
    - How to choose

Purple Table

- Issue
    - $
    - Public perception
    - Making the most informed life cycle assessment
    - Capacity to review long term decision
    - xxx[2] steps
        - Able to xxx[3] if xxx[4] xxx[5]
- Should we "store" in landfills materials for the future (generations) rather than use in EfW
- Is landfill bad
    - How do we decide!
- How does current landfill capacity affect decisions by EfW advocates?

- Lack of landfill space is not an Australian issue.
    - How do you justify EfW?
- Dioxins
    - Is there a limit that the public will accept?
- Some emission standards applied to EfW as applied to other developments
    - Net benefits assessment should apply to EfW
- Air emissions
    - Establishment of air emissions
        - Time 6 hours – 12 days
        - Feedstock and output (air) relationship
- If EfW process fails – repeatedly does public get off – sick
- Concern by public and authorities that EfW is incineration
- Community education
    - Role of the government
    - Emotive issued listed by NGO's based on the old dinosaur technology
- Gasifier versus incinerator
    - Public concern
- 100% of the energy generated by EfW facility should be considered as "renewable"
    - Do not exclude plastics, xxx[7], etc.
- Role of EfW
    - Can deliver the resource recovery preferences of society i.e. need power to run recycling facilities
        - Need a power island in the planet
- Electricity drive to generate waste
    - Do not confuse purpose grown biomass with the waste generation (other env. Benefits by biomass crops)
- PSP4: Interface waste generation and energy
    - Don't agree that energy demand stimulates waste generation
        - eg. How can increased air conditioning load on society be stimulating waste?

  - Is EfW absorbing the ills of 21st century society
    - re big waste producers
- EfW cannot solve all the intergenerational issues involved in waste production
- There appear to be better solutions for non polluting energy generation.
- Benefits of EfW
  - Role of energy production
    - Renewable
    - Distributed energy
    - Need to be pragmatic about EfW – can't hope to change all of societies consumer trends.
- Loss of soil organic carbon
- What nutrients if any are recovered from EfW.
- Review of waste hierarchy
- Total impact analysis of energy technologies
- Waste to energy versus other alternative technologies
  - Should the composting and recycling be rated higher than EfW in every application
- Technology review during 20 year project life
  - Mechanism for xxx[8]
- Selection of optimum technology
  - Don't think the cost of power generation should be compared with coal
    - We don't current xxx[9] in the cost of externalities (i.e. CO_2 production) to power price – why should EfW suffer this fate?
  - Also needs to consider ability of technology to scale up or down according to waste volumes over time
    - With compensation
- Do we consider total impacts of alternatives
  - i.e. diversion with large transport may be a worse solution than conversion to energy in a remote location
- Source separation is often the low cost solution. We should consider more effort her to solve the problem

- Best use of available material
    - In calculating the cost benefits using ESD principles, the true costs of landfill as a disposal option need to be captured.
        - i.e. fugitive emissions, site remediation, leachate management – 50 years of ongoing management.
- Community capacity to PAY for EfW
    - $$
- Societal costs of waste
    - Society must start to accept that to achieve higher loads of sustainability it will cost more than current practice
- Need for security of investment
    - lock in market and approval condition for a minimum period
- Life cycle cost of EfW
    - Rational xxx[13]
- Is a landfill levy, (tax) the best way to deter waste generation?
- Are/can we capture the true cost of externalities when evaluating technologies.
- Politics versus waste practitioners within a council
    - Who will control decision
- Will EPA take lead role in where EfW heads; will this policy take over
    - Or will price decide.

Green Table

- (1) Policy harmonisation on waste disposal (resources recovered) worlds best practice
    - EU
    - US
    - CAN
- (1) Highest use issues
    - Best use for waste
    - Volume economics creating demand.

- (1) Technology devt
    - Is devt matching pace of community needs
        - i.e. best use of resource, best practice
- (1) Emissions – harmonisation of standards.
    - Worlds best practice smart state
- (1) Life cycle approach
    - Maximum use of resource
- (1) Efficiency
    - Embodied energy
    - High processing effort
    - Net benefit
- (1) EfW could significantly reduce pressure on landfill facilities
    - Flow on environmental benefits
- (1) Prevention of loss of valuable secondary resources
- (2A) Currently insufficient (economic?) drivers to encourage greater waste management (supply side)
- (2A) Highly variable market value for "waste" materials
    - (eg. tallow for biodiesel, "green waste" bagasse)
- (2A) Waste sorting economics/practice
- (2B) Buyback rates and conditions for electricity often discourage small renewable energy /waste generators.
- (3) Stakeholder <u>policy</u> position
    - Determining a suitable/agreed balance between
        - Social { TBL
        - Economic { TBL
        - Environmental { TBL
    - Impacts/aspects of technology
- (3) Community commitment
    - We want sustainability
        - Do we want/are prepared to pay?

        - In our backyard?
    - Are we prepared to change individual practice
        - i.e. beyond feel good.
- (3) Community acceptance of technology promoted
    - Education/awareness
- (4) Coal used with improved efficiency etc. may be better than blind EfW initiatives
- (4) Emissions sometimes "better" than conventional fuels.
- (4) Consider local/regional factors in integrated waste management decisions
- (4) Composting economics
- (5) Need for R&D
- (5) Proven technology (EfW)
- (6) Loss of sustainability/nutrients
    - eg.
        - organic matter
        - soil fertility
        - productivity
        - loss of ability to convert solar energy to usable products
        - Ability to harvest energy lost
- (6) Land use of combustible bio-organics

<u>Blue Table</u>

- Role of government
- Lack of legislations supporting waste to energy projects.
- <u>Governmental Commitment</u>
    - State generators
        - Everybody
        - Somebody
        - Anybody
        - Nobody

- Life Cycle costs versus energy production
    - Is the exercise biased toward an economic outcome or is there a triple bottom line benefit.
- Technology driven rather than need driven
- Integration with other energy supply options
    - Eg. Ability to supply peak demand.
        - Where does this best contribute to the state's energy mix?
- Economic efficiency
    - Can the technologies compete without assistance?
        - To what extent should "assistance" be provided when compared to other "sustainable" sources such as renewables (only limited support/seek funding)
- Low tipping fees in the case of municipal solid waste to energy projects.
- Tipping charges
    - Low tip charges do not motivate alternatives
- Economics for smaller communities
- High capital and ORM cost of waste to energy plants comparing to conventional technologies
- REC's
    - Exclusion high CV materials from REC eligibility induces commercial viability. Alternate scheme for EfW would help.
- Lack of public understanding or poor public image.
- NIMBY issue
- Conflict (potential) between Wte and alternative treatments such as composting.
- Tyres (?)
- Can/are/should
    - Forest thinings use
- Can/are/should
    - Coal wastes be included in the discussion (REC credits)
        - Guide -> resource utilisation

- Fugitive gases
    - Is there a greater opportunity to capture fugitive gases from biogas production? Is there still a major leakage to the environment?
- Reuse of wastes currently landfilled
- Greenhouse gas credits
    - Trading
- Emissions impact on local airsheds
    - Energy conversion plants need to be strategically located so as to not cause undesirable air shed impacts.
- Weed wastes
- A positive use at a "waste" product
    - Reduces GHG emission etc.
- Emissions
    - And public perception
    - xxx[6]
- Discharges
    - Fuel storage
        - Waste storage/disposal
        - Leachate
- Consideration of alternatives
    - Need to ensure the most optimal /sustainable use of materials
        - Waste -> energy may not encourage less wasteful practices
        - Other "better" uses at the xxx[7]
- Should char from the pyrolysis of waste be combusted.
- Stabilisation/nature of char from the pyrolysis of wastes
- Stabilisation/nature of ash from waste combustion