ENERGY FROM WASTE SUSTAINABILITY PROJECT

NOTES FROM THE MELBOURNE STAKEHOLDER WORKSHOP

Held: Tuesday 8 October 2002

Time: 9.00 am until 12.00 pm

Venue: City of Banyule Rethink Centre,

Cnr Waterdale Road and Banksia Street, Bellfield

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 and then incorporated and resolved within 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 Melbourne 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 workshop 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 54 participants at the Melbourne Stakeholder Workshop. (A participant list is included as Appendix 1). Participants were seated around eight tables to discuss issues related to Energy from Waste. The summary of the discussion from these eight tables was recorded onto over-head transparencies and is presented below exactly as scribed.

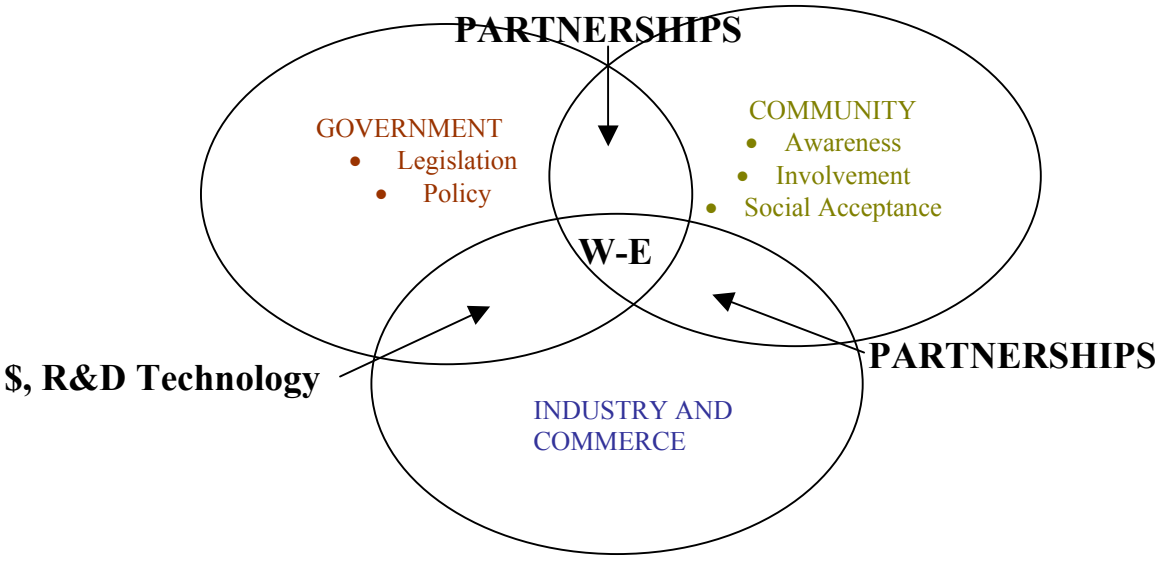
A catalogue of issues recorded by participants onto flash-cards is included as Appendix 2. These issues are also presented exactly as scribed. The colour of the flash-cards was used to differentiate between tables.

Blue Table

1. FUTURE
    i. Eliminate future options (negative)
    ii. Provide long term solution (positive)
    iii. Increase risk. (plant shutdown, high technology/process
2. ENVIRONMENT
    i. No landfill
    ii. Nothing gets wasted
    iii. Reduction in green house gases (process and systems)
    iv. Affects on environment uncertain (emissions)
3. COST
    i. Capital investment
    ii. Return on investment
    iii. Meeting agreed waste supply over time.
    iv. Location of plants – transport costs.
4. COMMUNITY
    i. Perception (not understand technology/history)
    ii. NIMBY – Risk!
    iii. Wasteful Culture
    iv. Potential user friendly kerbside systems.

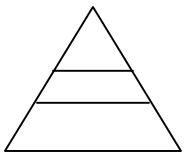
Red Table

Philosophical Model, Sustainability (ENV, SOC, ECO, TBL) Waste Hierarchy



- ⇨ Life Cycle Assessment.
- ⇨ Assessment of value of resources
- ⇨ $ Environmental Impact, renewable versus non renewable

1. BROADER ISSUES



   i. EfW and waste hierarchy
      - Aim for highest resource value
   ii. Needs tools and criteria to assess value of resources
      - Long term
   iii. Capitalism can't drive sustainability values.

2. ENVIRONMENTAL
   i. Emissions
      - Beyond statutory requirements
   ii. Total environmental aspects must be considered
   iii. Residuals from EfW must be appropriately addressed.

3. COMMUNITY AWARENESS AND CONCERNS
   i. Community should drive the process
   ii. Deal with perceptions that may not be reality
   iii. Appropriate siting an imperative
   iv. Partnerships between community and facilities e.g. closed loop process.

4. GOVERNMENT LEGISLATION/POLICY
   i. Mandatory standards needed.
   ii. Support of statutory authorities
   iii. Review tariff levels of electricity/gas to make alternatives more economically feasible.
   iv. Montreal protocol, etc. show tough regulations can work.

5. TECHNOLOGY
   i. "World's best practice"
   ii. Avoid feed the furnace.
   iii. "Flexibility in plants/technology for future change."

6. COMMERCIAL INCENTIVES/BARRIERS
    i. Little economic incentive for sustainable technologies (current energy costs, landfill costs low)
    ii. Need funding to support initial plants/pilot projects.
    iii. Government support necessary.

Orange Table

- Community issues eg.
    - Public perception and acceptance of EfW
    - "Waste" minimisation need to educate
    - Simple and localised system/s backed by comprehensive education programs
- Materials value and environmental impact eg.
    - Potentially high resource value materials going to EfW rather than recycling.
    - Product stewardship (rights to materials)
- Scale/cost/pricing eg.
    - Economic viability (eg. landfill prices in Victoria)
    - Potentially hungry for more materials
    - Potential monopoly??
- Reprocessing industry agenda for future (eg. Visy)
- Government commitment and regulation regarding EfW facilities. (eg. buffers, emissions, LCA analysis/value)

Purple Table

1. ECONOMICS
    i. Cost of EfW compared to landfill
    ii. Changes in the market
2. TECHNOLOGIES
    i. Driven by suppliers
    ii. Potential flow on effects from future waste stream

3. BUSINESS ISSUES
    i. Competition
    ii. Public versus private sector
4. COMMUNITY PERCEPTION
    i. "EfW = incineration"
    ii. Potential for more resource intensive land/management/infrastructure.
5. SITING ISSUES
    i. Transport issues
    ii. Buffer
6. WASTE MANAGEMENT HIERARCHY
    i. EfW
        - End of pipe solution.
    ii. EfW
        - May attract more waste including waste that is currently recycled/reused ("black box")
7. INTERGENERATIONAL ISSUES
    i. Management of residues
    ii. Potential for disposal /treatment of waste within one generation (i.e. generators)
    iii. Future waste stream?
8. ENVIRONMENTAL IMPACT
    i. Discharges
        - Solid, liquid, gas etc.
9. ENERGY PRODUCTION
    i. Alternative to fossil fuels
    ii. Consistent with ESD
    iii. Utilisation of a potential resource
10. LANDFILLS
    i. Fate of existing quarry holes?
    ii. Impact on local amenity
        - Odour, gas + litter – find alternatives to this

Yellow Table

1. COSTS
    i. Viability
    ii. High capital costs
    iii. Strategic approach
        - Integrate in existing infrastructure? xxx[1] out logistics
        - Holistic approach
        - Integrated infrastructure
        - Waste segregation -> suit xxx[2].
2. IMPACTS
    i. Waste segregation
        - "min" impacts – more xxx[3] at input
        - Community education – sorting waste
        - Helps support waste hierarchy
        - Better to pre-sort than try and sort garbage – xxx[4] recyclables.
3. POLICY
    i. Technology
        - Strategic/integrated
    ii. Participation
        - Who/how
    iii. Drivers
        - Landfill bans (Europe)
        - Landfill levy (high!)
        - Government role – producer responsibility
            - Packaging
            - "Take back" – Europe versus Japan compulsory recycling
            - Government strong leading role –> change.

4. SOCIAL
    i. Perception -> need for education
    ii. Location
        - Buffer zones
    iii. * the key issue*
        - Transparency/accountability
        - Credibility:proponent
                :process
5. WASTES HIERARCHY
    i. Collection systems
        - Can undermine – mixed waste
        - One bin – bad!
    ii. Segregation of wastes
    iii. Prioritising waste streams
    iv. Organics

<u>Peach Table</u>

- Future of landfills
- Greenhouse
- Magic bullet technology; technology influx
- Community engagement
- Renewable energy; energy efficiency
- Resource efficiency (land, materials)
- Residues and emissions
- Strategic planning; local systems
- Operating costs (transport)
- Investment scale / funding
- Market economics
- Impact on recycling
- Historical context (past technology)

Pink Table

1. ENVIRONMENTAL ISSUES
    i. EPA guidelines
    ii. Regulators/controls
    iii. Proven technology
    iv. Transparency
2. ECONOMICS
    i. What's in it for
        - Victoria
        - Technology providers
            - Need to attract them
    ii. Not only one solution
    iii. Different players/drivers
3. GENERAL DEBATE
    i. Philosophical
    ii. Everyone needs to be comfortable
    iii. More knowledge/data.
    iv. What is the non NSW paradym?
    v. Does debate need to wait for a plant proposal?
4. UNDERSTANDING ISSUES
    i. Getting message out
    ii. Perceptions
    iii. Lack of informed knowledge
5. COMMUNITY PERCEPTIONS
    i. Concerns
    ii. NIMBY/Location
    iii. Education
6. ENERGY
    i. Where we get it from
    ii. Whole system approach

7. LEVEL OF ENTRY
    i. Questioning waste hierarchy
    ii. Creating conflict with recycling systems
8. LCA
    i. Of products
    ii. Of energy systems
    iii. Need coordination of effects

<u>Green Table</u>

RESIDUAL SOLID/LIQUID WASTES

- Industrial application
    - No residue solutions?
    - No prescribed waste to landfill
- MSW
    - Residue/ash to landfill still needs to be managed
    - No landfill policy
    - Reuse of ash?
- Need to select inputs
- No technologies offer a complete solution

*All wastes need to be planned for

AIR POLLUTION – DIOXINS/FURANS

- Scientific uncertainty?
- Consultation process
    - Community buy in
- Normal operation OK
    - What about upsets?
- Technology is felt to be there
    - Community issues

COMMUNITY ISSUES SITING

- Buffers
- Community consultation and buy in

- No landfills policies
- Overall solution
    - Transportation
    - Large regional landfills
    - Come energy from waste

AVOIDANCE/REUSE/RECYCLING MARKETS

- High value pf plastics such as HDPE
- Need solution for residuals, but some of these are chlorinated
- Let economics drive this?
- Public perception a driver
- What comes out of kerbside collection
- Life cycle information needed

ENERGY VALUE ITSELF

- MSW → Landfill recover 25% energy
- Energy from waste plant 80% recovery? (but more expensive)
- Industrial use of waste for energy
    - Meeting own energy needs
- Industry not serious about greenhouse reductions

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
Blue table	0	6	0
Red table	0	4	2
Orange table	0	7	0
Purple table	0	4	*2
Yellow table	0	1 5*	1
Peach table	0	4	0
Pink table	0	2	4
Green table	0	2	5
Totals	0	30 5*	14

General comments from the tables regarding energy from waste

Blue Table

- Contingent
    - Based on waste hierarchy RCR -> EfW -> Landfill

Red Table

- Commercial and environmental risks must be addressed on their merits.
- There are compelling cases for EfW to deal with many waste streams eg. Biowaste, agricultural wastes, residual organics.

Orange Table

Contingent 7 (unanimous), 7 to the right but not always in all instances.

Purple Table

* Yes is too extreme, unrealistic

* including "landfill gas utilisation"

3 – local government

1 – state government (EPA)

1 – regional

1 – consultant

Yellow Table

*Hybrid – strongly yes/contingent

Peach Table

- Devil in the detail
- Cost benefit analysis
- Other technologies
- Triple bottom line

Pink Table

- Need to look at total energy picture
- Decide which method is used
- What materials we allow into the process
- Energy cycle analysis

Green Table

- Need clarity around what the role is
- How is it perceived to be sustainable
- Efficiency needs to be emphasised in the future
- Fossil fuel requirements
- Govt legislation important to maintain solutions
- Cost will be a driver

Appendix 1 – Melbourne Workshop Participants

Name	***Organisation***
Ric Blend	golder associates pty ltd.
Peter Brotherton	Sustainable Solution P/L
Randall Brouillette	SERWMG
Enzo Bruscella	Barwon
Kevin Burgess	City of Whittlesea
Kirstin Coote	Whitehorse Council
Michael Dixon	EBAC International Pty Ltd
Rade Djuric	
Martin Drerup	AMC
Fred Gassner	golder associates pty ltd.
Justin Glass	City of Melbourne
Jenniy Gregory	SEAV
David Henry	AES Pty Ltd
John Hewitson	Teris (Aust) Pty Ltd
Kevin Hince	Northern Regional Waste Management Group
Edmund Horan	RMIT University
John Hutchinson	SEAV
Libby Hynes	City of Darebin
Ian Jackson	Amcor Paper
Denis James	Visy Recycling
John Johnes	Teris (Aust) Pty Ltd
Adam Johnson	Hume City Council
Stephane Lallier	RMIT
Sally Lock	EPA Victoria
Joseph Lunardello	City of Monash
Andrew McIntosh	City of Greater Dandenong
Scott Maloney	EPA Victoria

Name	***Organisation***
David Maltby	HLA Envirosciences
Dorothy Marwick	(Cr.) Glen Eira City Council
Ron Mendelsohn	EarthPower
Marc Middleton	Ozmotech
David Mulholland	Wastemin Pty. Ltd.
John Nolan	Nolan-ITU Pty. Ltd.
Nick Orr	Enman
John Osborne	EPA Victoria
Jenny Pickles	Econecycle Victoria
Chris Randle	AAAllShape Pallets
Neil Rose	Council or Maroonda City Council
Maurie Schultz	City of Darebin
Greg Scott	Mitchell Shire Council
Gayle Seddon	CityWide
Jennie Slatter	EPA
Ian Smith	City of Stonnington
Max Spedding	
John Stamp	Manningham City Council
Michael Sterling	City of Stonnington
Graeme Stewart	Least waste
Cathy Van der Zee	Econecycle Victoria
Stan Vermeeren	Northern Region
Christine Wardle	Meinhardt
Matthew Warnken	Warnken I.S.E. P/L - Project Manager and Workshop Facilitator
Neil Whiteside	City of Whittlesea
Martin Williams	GHD
Sabina Wills	Waste Audit and Consultancy Services

Appendix 2 – Catalogue of Issues Identified at the Melbourne 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

Blue Table

Flash cards not used.

Red Table

- BROADER ISSUES
    - Guiding decision making
- Where EfW fits with hierarchy
- Materials should be highest value
- Capitalism cannot drive sustainability values?
- Must consider long term
- Criteria for assessing value of resources
    - $ versus CAL versus Earths finite RES
    - NR versus R
- TECHNOLOGY
    - Continuous improvement
    - R&D
- Multi-fuel capabilities
- "Hungry" for waste
    - Availability of small scale plants?
        - eg. gasification.
- Technology is always improving
    - We need to take advantage.
- Solar/wind resource recovery technology preferred.
- Anaerobic composting plants supported.
- COMMERCIAL
    - Incentives
    - Barriers
    - Support

  - Reality
  - "market driven"
- LOW COST OF LANDFILL
- Broader issues environment
  - Community awareness concerns
  - Government legislation and policy
  - Technology
  - Commercial
- Irregular feedstock
- Industry wastes ⟶ landfill
  - Equals missed opportunity
  - Leads to entrepreneurship!
- Cheaper to throw waste in hole.
- Pilot projects
  - Would be good case studies.
- Costs money and (government) support needed.
  - eg. commissioning.
- Commercial and environmental risks.
  - Funding to support initial plants
- Little economic incentive for sustainable technologies
  - eg. electricity/gas costs.
- GOVERNMENT LEGISLATION POLICY
- Support of statutory authorities eg. EPA, Councils, RWMGs, AGO.
- Mandatory standards needed.
- Low cost of electricity!
- Montreal protocol on CFCs, PG in petrol show
  - Tough regulations are possible
- COMMUNITY AWARENESS
  - Social
  - Concerns involved
- Community should drive the process

- Community concern
    - NIMBY
    - Perceptions (not always accurate)
- Appropriate siting
    - An imperative!
- Opportunities to partner with community
    - Eg. AG. Wastes.
- Community participation for recycling and behaviour with W-E
    - "throw away mentality"
- Environmental aspects/impacts
    - Planning/management
- Must consider total environmental aspects of any proposal
- Emissions eg H_2S.
    - Aim for compliance or beyond?
- Residual waste after treatment
    - Landfill
    - Toxicity?
- Need to increase community awareness
- No "feed the furnace" thinking.
- Need to recover and recycle as main priority.
- Must be integrated!
    - Take advantage of commodities
    - Bins and collection infrastructure/systems
- Heavy metals eg. sewage sludge.
- EfW opportunities to decrease GHG. Emissions from landfill.
- LIFE CYCLE ANALYSIS
- EfW
    - Opportunity to extend landfill life, limit the number of landfills.
- Some feedstocks problematic.
    - eg. HCl from PVC & treated timber.

Orange Table

- How do we ensure against monopoly abuse of EfW facilities
    - If we encourage "regional" facilities i.e. stopping alternative technology development.
- EfW
    - Potentially materials hungry
        - What impact on minimisation??
- Scale of EfW facilities
    - Require regional material sources (not individual councils)
    - Landfill too cheap in Victoria. / EfW costs higher.
- Product stewardship
    - Manufactures may have rights to materials (difficult to destroy – recovery options)
- Loss of potentially recyclable material
- Government commitment and regulation i.e. EfW facilities. (eg. buffers)
- LCA analysis
    - Needs to give balanced triple bottom line assessment.
- System/s adopted needs to be simple/affordable/localised.
- Educate community
    - Value of resources (eg. water, energy," waste")
- Need to keep community aware of need for "waste" minimisation.
- Community acceptance critical.
- What is on the reprocessing industry's agenda for the future??

Purple Table

- Economics
    - Cost of economic facility
- Economics
    - Costs increase compared to landfill
- Government to "disposal" of waste to EfW facility

- Transitional, cultural and economic cost of change.
    - (potential/perceived)
    - Threat to existing waste management regime.
    - Education required to manage transitional process.
- Cost of EfW versus landfill.
    - Are we really paying appropriate cost of landfill?
- What are the economic benefits (i.e. are there any?)?
- Potential for significant technology development and transfer to other industries/uses.
    - Potential flow on aspects.
- Driven by technology suppliers.
    - Can lead to focus away from solutions such as Bioreactor landfills.
- BUSINESS ISSUES
    - Competition policy
    - Cannot guarantee constant supply of feed
        - Monopoly
        - Another competitor – both go under.
- Public sector versus private sector
- Community perception
    - Siting
    - Potential for more intensive (land/management/other infrastructure management of waste.
    - i.e. suited for urban environment.
- Facility siting
    - More difficult than a landfill
    - EfW = Incinerator
- Public perception of EfW
    - i.e. hazardous waste siting.
- Community perception
    - EfW = Incineration

- Siting
    - Logistic/Transport issue
    - EfW may be perceived better than landfill by general population
    - Landfills are seen as pollution.
- Population base required to provide waste to EfW facility.
- Establishing facility on regional basis
    - High transport costs
- Transportation of MSW in its untreated form
- Potentially undermines waste hierarchy
    - EfW is an end of xxx[1] solution
- May end up as "black hole", attracting more and more higher value waste into the facility.
- Undermine community based reuse/recycling.
- Changing waste streams makes it difficult to manage
    - ? xxx[2] the xxx[3] waste
- Intergenerational equity
    - Completeness of EfW process i.e. outputs only. = energy + inert residual.
- Assuming residual can be made xxx[4], brings forward potential intergenerational problems into xxx[5] generation.
- Management of Residuals
    - Ash
    - Pyrolysis Residues
    - Potential Intergenerational Equity Issue
- What to do with residuals?
- Environmental Impact Discharges
    - Solid
    - Liquid
    - Gas
- Air pollution mixed waste stream makes pollution more difficult to manage compared to conventional fuels.
- Air pollution eg. dioxin.

- Energy production
    - Efficiency
    - Greenhouse
    - Gas
- Energy production
    - Instead of fossil fuel
- Acknowledge finite resources and maximise resource utilisation in all stages of resource life (primary, secondary – reuse etc.)
    - Consistent with principles of ESD.
- Efficiency of EfW
    - Landfill gas recovery relatively inefficient versus other systems.
- Landfilling of MSN
    - Longterm degradation impacts
- Current landfills impact on local amenity and residents through: odour, noise, litter.
    - Good to find an alternative to current system and associated problems.
- Finite sources of energy, need to look for alternatives to traditional sources (i.e. coal, oil and gas)
    - Double benefit-energy from waste can reduce landfill odour impacts on local community.
- Landfills
    - What's the fate of unused quarry holes?

<u>Yellow Table</u>

- COSTS
- Possible high capital costs of some plants
- Is it feasible for an incinerator treatment plant to be sited in the Latrobe valley?
- ENVIRONMENTAL IMPACT OF POLLUTANTS
- AIR EMISSIONS
- AIR POLLUTION CONTROL
- ODOUR REDUCTION
- ACHIEVEMENT OF COMPLETE COMBUSTION

- SOLID RESIDUES
- Not in my backyard problems
- COMMUNITY PERCEPTIONS
- "Toxics" Image
    - eg. dioxin/furan generation
- FEAR OF NEW PROCESSES
- LOCATION OF FACILITY
- Public education of potential of EfW
- Understanding of the components of the entire recycling & EfW supply chains
- Why is there no local government representative on the reference group?
- Who will be responsible for total waste stream disposal? Should it be one authority for all streams?
- Should we follow Europe and ban landfills?
- ENSURING BEST PRACTICE
- Choice and approval of technology
    - Low temperature versus high temperature
    - Level of controls
    - Testings
- Timing of landfill restrictions versus alternatives eg. EfW
- Proven technology versus pilot technology
- Reduced volume of landfill
- Reductions of landfill
- Impact of collection systems on a projects ability to maximise respect for waste hierarchy and highest order value of outputs.
- RESOURCE CONSERVATION
- On which materials do we concentrate prioritising?
- Diversion of uses higher up the wastes hierarchy.
- IDENTIFICATION OF INPUT COMPOSITION TO DETERMINE PROCESS NEEDS

Peach Table

- Air Quality
- Loss of Materials
- Historical/Context
- Past mistakes
- xxx[1] schemes xxx[2] sustainable alternatives
- Future of kerbside collections
- Impact on recycling, reuse and avoidance
- Impact on recycling schemes
- Transport
- Lowering of transport costs
- Transport
- Market-driven
- Markets of products – energy, fertiliser
- Economics
- Markets
- Capital requirements may restrict medium-longterm options.
- Revenue neutral or cash positive
- Reassignment of local government budgets
- Investment
- Reduction in operating costs
- Localised power generation reduction of infrastructure costs
- Timelines
- Regional involvement
- Regulations (Planning, EPA)
- Long-term planning
- LCA of options
- Long-term solutions
- Pollution
- Air emissions

- Disposal of residue
    - Char, bio-products, etc.
- Residues
- Recycle value benefits
- Politics
- Community education
- Community consultation
- Public perceptions
- Public opinion
- Public acceptance
- Social benefits
- Perceptions
- Community interaction
- Effective engagement of stakeholders
- Proven technologies
- Technology maturity and feasibility
- One size fits all mentality
- Magic bullet mentality
- Emerging technologies
- Composting
- Greenhouse emissions
- Greenhouse gas capture
- Minimisation of greenhouse gases
- Delay of global warming phenomenon
- Landfill diversion
- Diversion from landfill
    - Elimination of leaching unsightliness, odour vermin
- Landfill
- "Green" energy
- Reduction of demands on non-renewable resources
- Energy efficiency – demand management
- Renewable energy

- Transition to renewable energy future
- Green power (only high end will qualify)
- Improved land use.

Pink Table

- LEVEL OF ENTRY
    - Concern – WTE
    - Are we creating problems/conflict with recycling current systems
        - Questioning waste hierarchy
    - Potential negative impacts on recycling
    - Resource driven industry coal
    - Addressed via: LCA <- plant integration
- LANDFILL
    - Role of landfill
    - Dealing with landfill
        - In transitional process
    - Still needed to some degree
    - Future of quarry holes strategic
    - Planning
    - Get energy from landfill already
    - Starting a landfill
    - Landuse
    - Solution for quarry holes may disappear.
- FUTURE OF QUARRY HOLES?
- Reduce the volume of wastes going to landfill
    - 90% (ash)
- Reusing the waste
    - Landfill prolonged
- What's wrong with landfill
- New industries economic employment
- Support for domestic technology providers in VIC
- Price/cost impacts in VIC and levy

- Who gains to benefit
- Subsidise/costs
- ECONOMICS
    - What's in it for
        - VIC
        - Technology providers
    - Economic opposition
        - No one fit
        - Need to attract them
    - Different drivers
- LCA
    - Of product
    - Of total energy
    - Low profile
    - Convincing output is real
    - One input into decision making
    - Coordination of LCA effort.
- Paradym shift required
- What is the waste hierarchy
- Pulling wastes up/down the hierarchy
- Entry point to EfW regarding feedstock
    - Pre or post recyclables extraction?
- What goes into the plants?
- Prevent recycling in using wastes to get energy
    - Combination of different treatment
- Loss of resources
- Incineration of recyclable material?
- Attention drawn from recycling
- Contradiction to reduce reuse recycle – need to revisit?
- Reduced opportunity to cradle to cradle (re-use)
- Waste avoidance not encouraged
- Is it safe?

- What are the controls?
- Facility approval process EES required
- Pollution controls regarding air quality
- Gas emissions in case of burning even in the best modern facility
    - Dioxins and xxx[1]
- Environmental sustainability
- Carbon release accelerated
- The popularly xxx[2] "waste hierarchy" is largely subjective, and unnecessarily restrictive assessing waste to energy.
- ENVIRONMENTAL IMPACTS
    - EPA guidelines regulators/controls
        - Increase community control in systems
    - Technology proven
    - Transparency
    - Whole system
- - Reusing the waste
    - New industries
        - Economic
        - Employment
    - Landfill prolonged life
    - Carbon release accelerated
    - Reduced opportunity for crade to cradle re-use
    - Attention drawn away from recycling
- - UNDERSTANDING ISSUES
        - This forum
        - People came along
    - COMMUNITY PERCEPTION
    - ENERGY
        - Whole system approach
    - LEVEL OF ENTRY
        - Questioned waste hierarchy
        - LCA – coordinated effort

- VOTE
    - Total energy cycle
- - ENVIRONMENTAL IMPACTS
        - Proven technology
    - ECONOMICS
        - What's in it for the players
    - GENERAL DEBATE
        - Who is here?
        - Who is not here?
        - What is non NSW answer?
        - Does debate need to wait for a plant?
- GENERAL DEBATE
    - Philosophical debate everyone needs to be comfortable
    - More knowledge/data outside industry forum
        - Out to community and other stakeholders
- - Does debate need to wait for a plant?
        - Need to prepare groundwork
    - What is the non NSW paradym?
- ENERGY
    - Where we get it from
- Getting something valuable for wastes
    - Energy instead of landfilling where you only get fees from consumers buying their wastes
- Save energy from coal or petroleum
- Resource access, processing and recovery frequently overlooks the energy components. We need to look at total inputs and outputs.
- Steady waste supply
- Energy usage is the fundamental issue on which sustainability will be developed
- SITING PROCESS
- COMMUNITY EDUCATION
    - Awakened of EfW sustainability benefits
- Problems for the neighbours of the plant (odour, dust, traffic)

- Community consultation challenge in VIC
- Who will want the plants near them?
- COMMUNITY CONCERN
- When looking at the negatives of Waste to Energy, we need to be realistic and honest in reporting negatives of alternate energy sources.
- UNDERSTANDING ISSUES
- COMMUNITY PERCEPTIONS
    - Concerns
    - NIMBY
    - Location
    - Education
- EDUCATION
    - Don't understand recycling
    - Don't understand everything
    - Getting message (perception) out to community waste industry.
- UNDERSTANDING ISSUES

<u>Green Table</u>

- POOR PUBLIC PERCEPTION OF EFW?
    - HOW WILL THIS BE TRACKED
- SITING ISSUES AND COMMUNITY 'NOT IN MY BACKYARD CONCERNS'
- DESTINATION OF WASTE
- WHAT HAPPENS TO ALL THOSE HOLES
- LANDFILL REDUCTION/REPLACEMENT
- EMISSIONS
- POSSIBLE ENVIRONMENTAL IMPACTS
- Responsible environmental issues? Pollution
- AIR POLLUTION
- COMMUNITY CONCERN ABOUT DIOXINS/FURANS AND OTHER AIR POLLUTANTS
- DISPOSAL OF RESIDUES? (SOLID, LIQ, GASESOUS)
    - (Heavy metals …. etc)

- ENERGY PRODUCTION/GREENHOUSE SAVINGS
- WISE USE OF WASTE STREAM
- EXPORT OF TECHNOLOGY INTO SOUTH EAST ASIAN MARKETS (BUSINESS OPPORTUNITIES)
- HIGH STANDARD OF ENVIRONMENTAL MANAGEMENT
- Efficiency – in process
    - Not overproduction of waste
- COST EFFECTIVENESS VS RECYCLING/LANDFILL
- GREEN ELECTRICITY PRICING
- ECONOMIC SUSTAINABILITY
- IS IT REALLY SUSTAINABLE
- RFA WASTE
    - [Black Energy?]
- MANAGEMENT OF COMMUNITY ISSUES THROUGH
    - CONSULTATION
    - EDUCATION
- PLANT NEEDS DRIVE INPUTS
- ENCOURAGING WASTE AVOIDANCE + PROTECTING RE-USE/RECYCLING MARKETS