



East Rockingham
Waste to Energy



Lessons Learned Report

May 2020

Lessons Learned (Development Stage)

Project Name	East Rockingham Waste to Energy
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Site Selection

- Land zoning is a very important factor in site selection. Where possible waste to energy projects should be located in Heavy Industrial Zones
- Ensure the site has adequate buffers to residential zones and sensitive receptors, such as schools
- A minimum buffer of 500m should be sought to ensure no real or perceived impacts on sensitive receptors
- The site needs good road access for delivery of waste (to allow access to site without impacting residential areas)
- The site needs good access to the power network to allow export of power (economic and technically feasible grid connection)
- Ideally the site is located near industries that could utilize steam (paper mill, industrial laundry)

Community

- The community is the number 1 stakeholder in a waste to energy project.
- Waste arising contracts are the most acceptable to the community because they don't restrict recycling or waste reduction efforts (more detail on page 13)
- Waste arising contracts mean councils only promise to deliver residual waste left over after recycling and recovery efforts, not set volumes of waste
- Make the project relatable to the community as outlined on page 6
- Be honest about the advantages and disadvantages of the project
- Make a consistent effort to engage with the community through the whole project life.

Community

- Its important to make waste to energy relatable and understandable to the community.
- This is achieved by sharing general knowledge about waste and its implications on the environment and community when discussing waste to energy projects.

What is Waste to Energy?

- Waste has embodied energy
- 1 plastic bag has enough energy to move a car 11 meters!

Why do we need Waste to Energy?

- Waste generation per capita in WA 2.6 tonnes per capita 2014-15
- Landfill statistics - 644,000 tonnes of Perth household waste was sent to landfill

Environmental Approvals

- Waste to energy projects will attract the highest level of assessment by the environmental regulator
- Proponents should embrace a detailed assessment process and factor in the project timeline of 18 months to 2 years to complete (including appeals)
- Independent human health risk assessments of projects build confidence in the community
- Get the right team and consultant for the EPA approvals
- Set a realistic budget for this work – there are no shortcuts.

Regulator & Key Stakeholder Education

- Significant effort was applied to educating regulators and State and Local Government stakeholders
- The Environmental Protection Authority in WA undertook significant effort to self educate about waste to energy.
 - <https://www.epa.wa.gov.au/environmental-and-health-performance-waste-energy-technologies-report-1468>
- This process created a roadmap for environmental licensing of waste to energy projects in WA
- Local Government was were engaged at every opportunity by East Rockingham developers:
 - Council meeting
 - Conferences
 - Community debates
 - Reference site visits
 - Formal submissions
 - Media

Grid Connection

- Grid Connection: consider accessibility and cost of grid connection when selecting a site (cost can vary from \$6 to \$15 million)
- Western Power may require a contribution from the project developers to reinforce the network in addition to connection costs. These costs can greatly impact project economics so try and identify them as early as possible
- Connection to the South West Interconnecting System (SWIS) in WA has long been a difficult process.
- The Application and Queuing Access Policy where Competing Access Groups (CAG's) amalgamate for a joint network connection can add significant project risk for proponents.

Grid Connection

- The East Rockingham WTE project opted for a Reference Connection.
 - The advantage of this process is a bespoke network connection is designed for you individually.
 - The disadvantage is all connection costs including upgrades to the network are borne solely by the proponent.
- The most important consideration for a reference connection is the location of the project. They are only viable in locations that have network infrastructure in place to allow for the additional power capacity.

Power Purchase Agreement (PPA)

- Corporate PPA market can be difficult with limited opportunities to attract partners with viable creditworthiness, at favourable pricing, with acceptable contractual terms. Try to retain competitive tension in PPA sourcing process for as long as possible
- Difficult in Australia to co-locate facilities where there is potential for steam/heat offtake. Try and involve potential PPA offtakers in discussions early to optimise chances of co-location as part of site selection process.
- In Western Australia about $\frac{1}{4}$ of revenue for a waste to energy project will be derived from a PPA

Project Finance

- Requires credible technology solution (matched to the waste stream) with multiple banked solutions internationally to be capable of being project financed
- Involve banks who are experienced in WTE sector internationally to bring their knowledge and capability to help get projects over the line – some local banks with limited/no experience will struggle to get across the detail/risks.
- Model audit: Developers should work with lenders (incl. ARENA) from an early stage to ensure:
 - list of all assumptions is comprehensive; and
 - those assumptions are subject to interrogation and challenge early and then regularly.
- There is enough repetition across many projects that the knowledge from earlier projects can be more effectively shared.

Project Finance

Securing Debt & Equity:

- Waste to energy projects are very difficult to finance as all bankable components must be finalised prior to financial close:
 - Waste Supply Agreements (60% - 70% contracted)
 - Power Offtake Agreement (70% + contracted)
 - Network Connection Agreements
 - EPC Contract
 - O & M Contract
 - Interface Agreement
 - Land Tenure Agreements
 - Environmental Approval
 - Planning Approval
 - Others
- Significant financial risk lies with Project Developers
 - Very expensive to get a project “finance ready”
 - All development expenses are “at risk” until close

Commercial Model – Waste Arising Contracts

- Of all the “firsts” in the East Rockingham WTE project, the one that will have the greatest impact is the “waste arising” contract structure.
- It was a fundamental principle for the EMRC in its August 2016 tender that the Councils not be exposed to waste volume or composition risk
- Their rationale was strong: in order to meet continually increasing waste diversion targets, the Councils must be able to implement improvements to their waste management practices over time without fear of being locked in to a put-or-pay contract
- With the transfer of this risk to the Project, Funders paid significant attention to their diligence on the Perth waste market
- Most importantly, it’s a critical issue in securing and maintaining a social licence to operate in this fledgling sector in Australia

Technology

- Proven technology is essential, with multiple plant references at similar scale and processing waste streams that your plant will be treating
- It is essential to understanding capability/willingness of technology provider to participate in EPC, and in what capacity
- Understand your technology provider's scope of supply. The more they supply (chute to stack), the less interfaces exist with multiple equipment vendors
- The technology provider needs the credit worthiness to adequately provide the necessary guarantees under the EPC contract
- It is beneficial for the technology provider to have operations and maintenance experience and reference facilities.



Converting Perth's Waste into sustainable energy