ACT Government

WASTE-TO-ENERGY IN THE ACT

CONSULTATION REPORT

TRANSPORT CANBERRA AND
CITY SERVICES

March 2020

Table of Contents

Consultation Report

Community engagement on Waste-to-Energy (WtE)

INTRODUCTION

The ACT Government is committed to responsible and effective management of waste. The *ACT Waste Management Strategy 2011-2025* set an ambitious target of 90% resource recovery by 2025.

Between 2016 and 2018 the ACT Government conducted the Waste Feasibility Study to seek pathways to achieving the 90% resource recovery goal. A key outcome of the study was the Waste Feasibility Study Roadmap which was released in May 2018. This Roadmap will guide the management of waste in the ACT into the future. Importantly, the Roadmap recognises that the ACT is unlikely to move beyond 80% resource recovery without some form of waste-to-energy.

One of the key recommendations of the Waste Feasibility Study was the development of a waste-to-energy policy for the ACT. The intent of producing a waste-to-energy policy is to provide a long term, informed and evidence based policy vision for waste-to-energy in the ACT that provides certainty for both the community and industry.

In September 2018 the ACT Government released an information paper and commenced a ten week community engagement process to seek community and industry views about waste-to-energy including what should be considered when designing a policy and what outcomes a waste-to-energy policy should achieve.

Waste-to-energy is a term that covers several different technologies that treat waste to recover energy as an alternative to, or sometimes before, landfilling. The most prominent waste-to-energy technologies are:

- incineration
- gasification
- pyrolysis
- refuse derived fuel (RDF)
- landfill gas capture
- anaerobic digestion.

We were keen to hear from the community about different technologies and people's concerns and ideas about waste-to-energy at a very early stage in the policy development process, so that any policy could be co-designed and properly consider the diverse views of the community.

This is a report on what we heard during the community engagement process conducted between 27 September and 14 December 2018 on what a waste-to-energy policy should look like in the ACT.

THE CONVERSATION

To engage a wide cross-section of the community we used a variety of different engagement methods. This included public information sessions, community and industry focus groups, an electronic and paper-based survey, one-on-one sessions with the project team and community stalls across Canberra town centres and in Libraries. Stalls were held at Woden, Civic, Dickson, Belconnen, Gungahlin and Tuggeranong.

We also recognised throughout the engagement that waste-to-energy is a complex subject that can be very technical. Because of this no one tool (such as a survey) or activity (such as a focus group) can provide a holistic picture of the benefits, concerns and considerations for any technology. Throughout this report, both quantitative results (like survey data) and qualitative results (like insights from one-on-one conversations and focus groups) are used to provide the most robust view possible.

During the consultation process:

Engagement	Number
Unique surveys completed	251 survey responses
Public information sessions held	One session 14 attendees
Community focus groups held	Three groups, 17 participants
Industry focus groups held	One group, 14 attendees
Written submissions	32 received from industry and community
Public information stalls	Ten, across all town centres in Canberra, reaching 300 people and resulting in 50 detailed engagements
One-on-one sessions	Five sessions (more than 30 were available)
Community councils	Three presentations
Postcards distributed	200 postcards
ACT YourSay Website	1,632 website visits, with 967 unique website visits

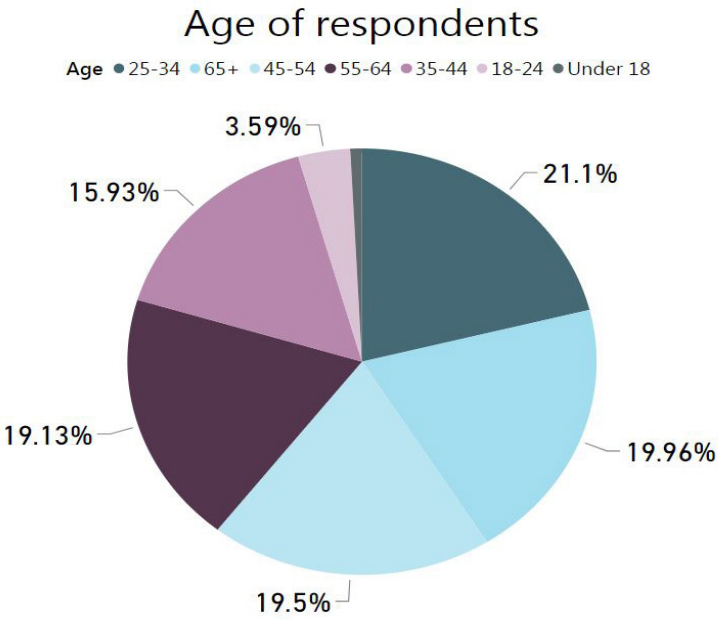
While some members of the community raised concerns about the engagement, including that it was of a technical nature, the full range of engagement methods were designed to capture people's views as a starting point for developing a position on waste-to-energy in the ACT.

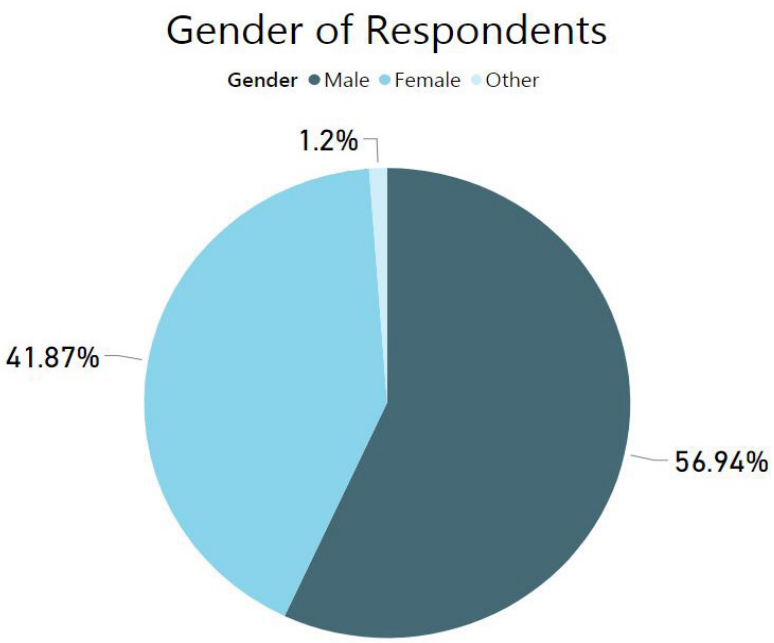
It was also clear through our engagement that people in the ACT are well informed and interested in having a say on this topic.

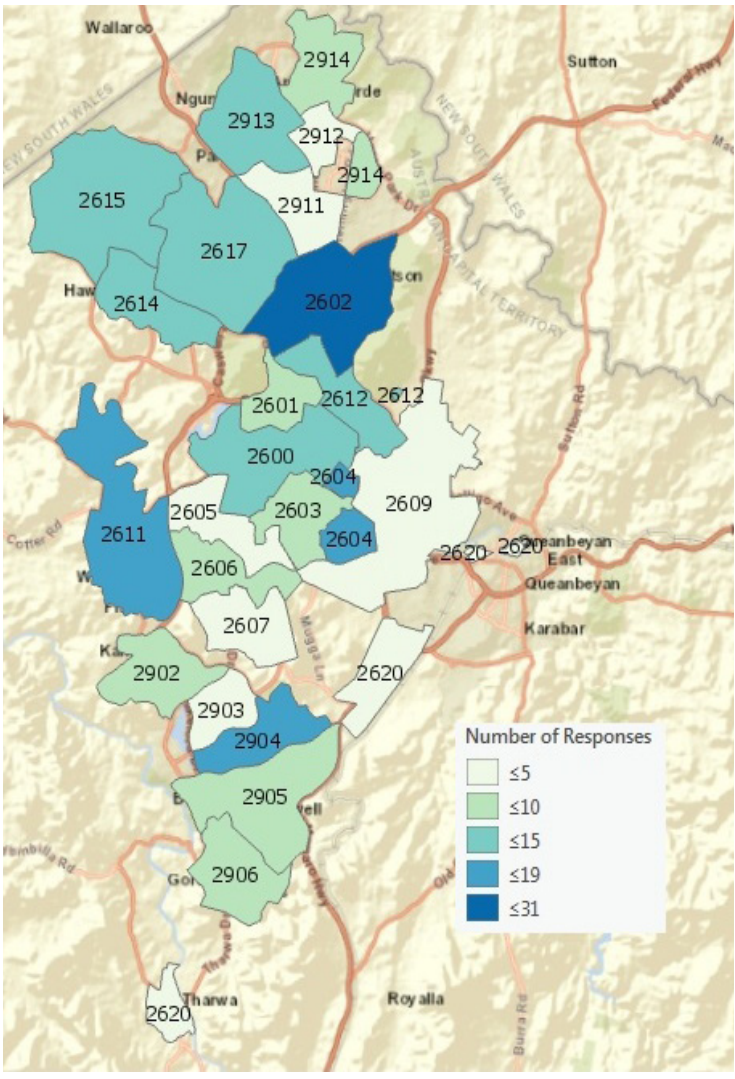
Overall, over 90% of respondents to the survey were satisfied or very satisfied with the opportunity to have their say.

SNAPSHOT OF SURVEY RESPONDENTS

Over 250 people from diverse age groups completed the waste-to-energy survey. Below is a snapshot of our survey respondents.





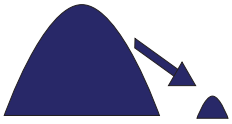


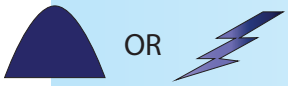
KEY INSIGHTS

The following key insights emerged from the community engagement process:

Canberra has an opportunity to, and should be, a world leader in waste management. This does not necessarily mean pursuing waste-to-energy technologies.

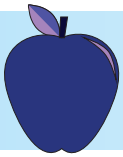
There needs to be more focus on reducing waste, through greater responsibility by manufacturers, retailers and consumers, to move towards a circular economy. This should ideally take place before we consider waste to energy technologies.





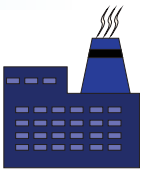
Introduction of waste-to-energy in the ACT is seen to be more about waste management rather than electricity generation, given our 2020 renewable energy targets.

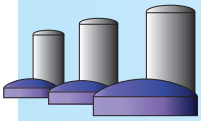
More effort needs to be directed towards improving re-use and recycling, with a stronger focus on education and awareness. This could be achieved through effective partnerships, for example between Government and industry partners.



Organics need to be diverted from landfill as a priority.

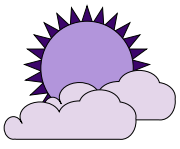
Any form of thermal waste-to-energy technology will have significant objection from parts of the community due to health and environmental concerns, and the community is a critical stakeholder.





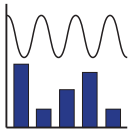
Anaerobic digestion was the most accepted of the technologies discussed in the engagements although composting was also a popular alternative.

A waste-to-energy policy should be outcomes focussed and lead to the lowest amount of waste going to landfill and the lowest level of greenhouse gasses going into the atmosphere.



A moratorium on thermal technologies for the short-term was a popular concept with some people although proposed timeframes differed in length from 5 to 25 years.

More information and data is needed to help people make informed decisions about waste-to-energy projects, including access to experts.



CANBERRA'S FUTURE VISION FOR WASTE

Waste-to-energy is a part of a broader conversation about the waste we generate and how we deal with it. Throughout the engagement it became clear that the community and industry agree that Canberra has an opportunity to become a national and world leader in waste management and recycling, and should work to this vision. The community also expressed their view that there are alternative methods to manage waste other than waste-to-energy facilities or landfilling, for example more diverse reuse and recycling.

Some of the key themes we heard from the community around broader waste management were:

- There should be a greater focus on education and awareness about recycling.
- There should be a greater focus on reduction of waste, and this could include banning single use plastics.
- There should be greater source separation, including of recyclables, for industrial and domestic waste. Some European countries have seperate collection containers for up to seven waste streams in their houses.
- Diversion of organic materials from landfill is critical.
- There should be greater responsibility on manufacturers and retailers to engage in product stewardship programs to recycle the products they make or sell.

"European countries ... have embraced, more than in Australia, the concept of Extended Producer Responsibility"

"We need another solution for food scraps so that they can be used to produce compost and fertilizer to replenish our soils"

"We should be reducing our waste and recycling what is currently waste"

"Foodwaste contaminates other waste streams and should be separated out as early as possible in the system. Preferably at the point where it is produced"

"Preventing waste is the most efficient process and this should be done through legislation and education"

"Residual waste that cannot now be recycled should be treated as a "delayed recycling""

WASTE MANAGEMENT OR ENERGY GENERATION?

Throughout the engagement, the project team were often asked whether the waste-to-energy discussion was about waste management or electricity generation. This is a question we also posed to the community during our engagement.

Primarily, the conversation was around waste management and how to best manage our residual waste streams. There was concern in the community that the introduction of waste-to-energy in the ACT was not best-practice for electricity generation and that the focus should instead be on developing more electricity from renewable sources.

Some participants also highlighted that the ACT is on track to contract 100% of its electricity from renewable sources by 2020 and hence more power generation was not required, and that this really focussed waste-to-energy as a waste management conversation in the ACT context.

It was also recognised by a number of participants, however, that if waste-to-energy was introduced in the ACT it could and should be implemented to improve renewable energy penetration. For example, a waste-to-energy facility could operate to supplement power when wind and solar resources are low.

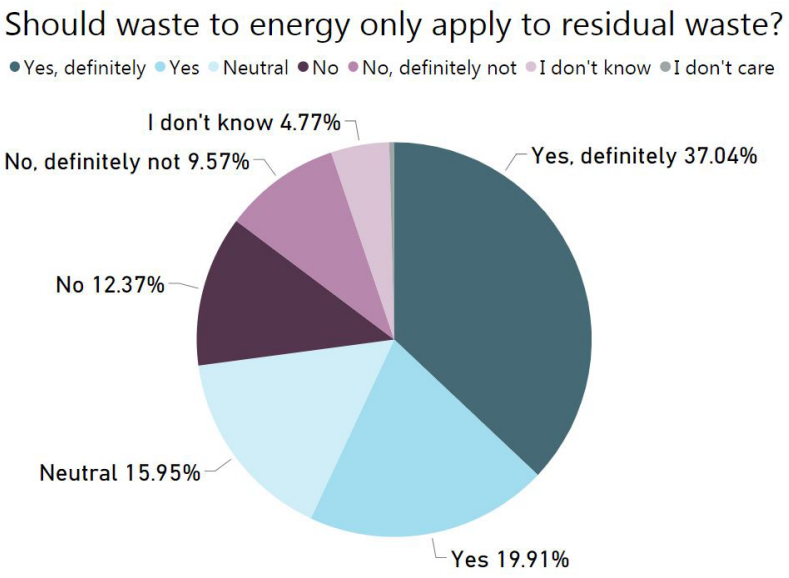
RESIDUAL WASTE

Residual waste is what is left in the waste stream once everything that can be reused or recycled has been removed and there is no higher purpose for the remaining waste. This is the component of the waste stream which is currently sent to landfill.

The waste hierarchy indicates that this waste stream is the only component of waste that is eligible for waste-to-energy, although internationally some waste-to-energy facilities operate off more than just residual waste. The survey results regarding residual waste showed that 56.91% of respondents said yes (19.91%) or yes, definitely (37.04%) to waste-to energy only applying to residual waste, while 21.94% of respondents said no (12.37%) or definitely no (9.57%).

These results indicate that if waste-to-energy processes were introduced in the ACT the community is quite clear that it should apply only to the residual waste stream. This is consistent with feedback we have received from face-to-face engagements throughout the consultation period. Although some participants in the engagement held the view that waste-to-energy should not apply to any waste stream (i.e. we should not have some waste-to-energy technologies).

"we need to reduce our ecological footprint by consuming less – so there is no away to 'throw to'"



FOCUS GROUPS

During the engagement we held three community focus groups and one industry focus group. The focus groups were a source of lively discussion where issues around waste-to-energy and waste management could be discussed in detail. Although there was not always agreement on all issues, some of the key themes that emerged from the discussions are discussed below. All views expressed in these forums will inform the policy position.

Community focus groups

The project team were lucky to have many knowledgeable and enthusiastic participants in community focus groups. We had members of community councils, experts on waste and waste-to-energy including in international jurisdictions such as Wales and California, a student studying sustainability and some generally interested and/or concerned community members.

In some groups it was clear that the community wanted to have a wider conversation about waste before we could discuss specific waste-to-energy technologies or policy positions.

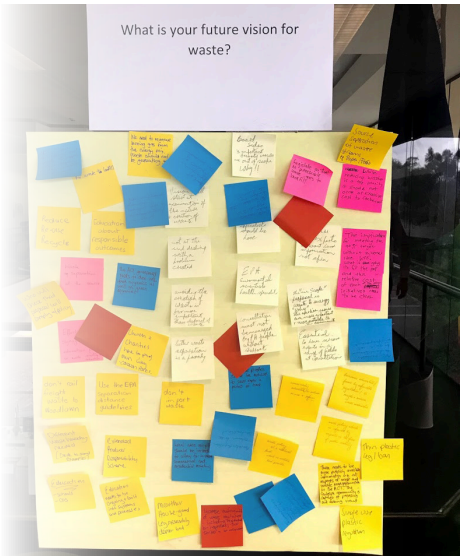
Participants generally felt that more effort is required to educate and inform the community about how to recycle and reuse items, reduce contamination rates and to divert all organic waste from landfill, before moving to waste-to-energy technologies. Generally, thermal technologies were opposed although there was discussion around issues such as burning medical waste, existing thermal treatment of sewerage sludge in the ACT, and pyrolysis of organics.

Incineration was discussed in detail. Participants were generally not in favour of thermal technologies, and in particular incineration, although there was little distinction between the different thermal technologies. For some items in the residual waste stream, landfilling was preferential to thermal treatment for many members of the community.

Concerns in focus groups varied between the health impacts due to the creation of toxic emissions such as particulate matter, poly-chlorinated organic compounds, polycyclic organic compounds and carbon dioxide. Some participants explained that they did not fully trust proposed scrubbing technologies as part of incineration. Some community members also had concerns with Government's ability to regulate such technologies, and ensure best-practice.

Siting was also a common issue. Community members generally felt that there was nowhere in the ACT where an incinerator could be located to be a safe distance from homes and that even though facilities are in close proximity in other jurisdictions around the world, this does not mean it is a good reason to do it in the ACT.

A key theme that emerged was that what happens internationally is not necessarily best-practice or suited to the ACT context, and we should take the opportunity to be a leader in this space.



The implementation of a Processed Engineered Fuel (PEF) facility also had significant discussion time in focus groups. Some participants saw PEF as a two-staged incineration process with the addition of the emissions required to transport PEF to its final destination. There were concerns about exporting our waste to another jurisdiction and making it someone else's problem and that if PEF was exported overseas then it may not be subject to the strictest possible emissions and/or air quality standards.

A key theme that emerged was that we shouldn't make ACT waste someone else's problem. Similarly, we should not be taking waste from other jurisdictions, although regional solutions are considered more acceptable.

Anecdotal evidence from a participant with extensive overseas experience, including overseeing the development and operation of a PEF plant, indicated that it was very difficult to operate a PEF plant with a variable waste stream.

A key concept explored during the focus groups was how to deal with items that are difficult to recycle, such as shoes which contain many different materials that are difficult to separate. While the waste hierarchy suggests that the best option is to recover the energy embodied in the resource, some community members felt that energy recovery by diverting a resource from landfill in the ground into the atmosphere in the form of carbon dioxide is not acceptable practice. There were differing opinions on this issue among participants.

One focus group talked about the rapidly changing nature of technologies, and that policy should be reviewed regularly, as much as every five years.

A moratorium on thermal technologies, with the possibility for review down the track, was a key theme in focus groups.

Generally it was felt that the ACT should not be using thermal technologies at this point in time, although there may be merit in technologies in the future. Many community members felt that incineration was out-dated and would never be suited to the ACT, or a best-practice approach.

Anaerobic digestion was generally considered as a favourable waste-to-energy technology although composting was also thought to be a good alternative. Community members were clear that good regulation was required of any industry to ensure positive health and environmental outcomes, and ensure that we are doing the best we can in reducing, reusing and recycling waste.

Industry focus group

The project team also led a focus group to hear the views of industry representatives on waste-to-energy. In this session we had representatives from eight companies. Some of the key themes discussed are as follows.

There was general agreement that industry want a policy that is outcomes focused, states a clear vision for the waste-to-energy industry in the ACT and provides leadership. It was also noted that some waste-to-energy technologies may become vital in the future.

The views from the industry participants on how a waste-to-energy plant would operate were very similar to community views in that they recognised that only residual waste should be used to recover energy. They also noted that significant sorting of waste should occur before any thermal treatment and any recyclable items such as glass, metals and wet organics should be removed.

A commonly held view was that items which cannot be recycled right now for either economic or technical reasons were still a resource and that we could be using this resource to recover energy.

Some participants felt that the electricity generated by a facility is still an important component of a proposal and should be considered in any cost benefit analysis when considering a proposal.

Industry recognised that there was a role for greater source separation at the community and commercial level.

It was also recognised that a social license was required to operate a waste-to-energy facility. However, the level of community engagement that would be required was not clear. It was acknowledged that obtaining a social licence to operate from the community now would be difficult due to waste-to-energy project proposals in the recent past.

"Incineration and gasification produces ash, which may be able to be used in road base, concrete, and soil enhancers"

ONE-ON-ONE SESSIONS

As part of the engagement, one-on-one sessions were available for community members to discuss the waste-to-energy policy development in detail with the project team. Five participants took up the opportunity. A number of phone conversations were also held with community members. The knowledge of participants and their enthusiasm to be involved in the policy development process was impressive.

The one-on-one engagements provided the project team a great opportunity to hear community opinions, concerns and ideas for innovation in the waste management sector.

Participants were well prepared bringing questions about how the ACT waste system operates now, how it might change in the future as well as examples of other waste-to-energy facilities and policies in international jurisdictions. Overall the views of participants ranged from anti-thermal technologies to generally supportive as long as the right governance was in place.

Climate change and emissions, and what impacts waste-to-energy in the ACT might have, was an important discussion point. It was recognised that there will always be some emissions due to waste management activities including waste-to-energy and these will need to be managed and properly offset to make a truly carbon neutral waste sector.

A key concept of one session was how the content of the waste stream changes significantly every 10-15 years with new technologies, materials etc. For this reason, investing in infrastructure (such as an incinerator) with a 25 to 50 year lifetime was not considered a sensible option, especially if waste is reduced over time as the ACT transitions to a circular economy.

Other participants had the view that once organics were taken out of domestic red bins and commercial waste bins and innovative recycling methods took hold, such as the TerraCycle in the US for shoes and other difficult to recycle items, then there would be no need for any form of waste-to-energy.

Another participant with experience in the European waste system was surprised we were considering incineration as a waste-to-energy technology for the ACT describing it as an outdated technology. It was noted that anaerobic digestion was tried and tested in Europe and that it would be appropriate for the ACT.

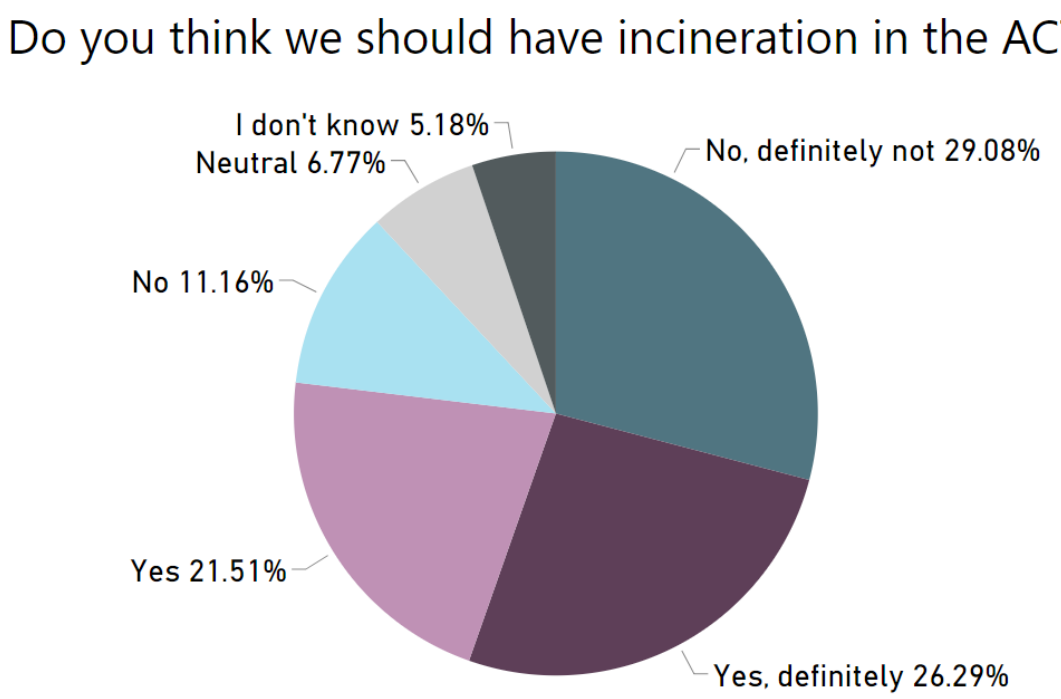
WASTE-TO-ENERGY TECHNOLOGIES

Discussions about each of the waste-to-energy technologies was a key focus of the engagement. A summary of what we heard in relation to each technology is set out below.

Incineration

Incineration is a thermal treatment technology that involves using the waste stream in a combustion process at very high temperatures to produce heat which can be used to generate electricity. Incineration plants utilise filters (scrubbers and condensers) to remove regulated substances.

Incineration technology was a major discussion point during the engagement, especially in focus groups and written submissions. The survey result was polarised on whether we should have incineration in the ACT. 47.8% of respondents said yes (21.51%), or yes definitely (26.29%) while 40.24% of respondents said no (11.16%) or definitely no (29.08%). However, when discussing incineration face-to-face with community members there was a higher degree of concern from the community and those we spoke to were generally against allowing incineration to occur.



"Incineration poses an unacceptable risk to environment and should not be considered as part of a clean energy policy"

Incineration continued

Face-to-face interactions and comments in survey responses identified some pros and cons to having incineration in the ACT:

Pros

- Is a method for diverting residual waste from landfill.
- Can generate base load electricity.

Cons

- Is an inefficient way of generating electricity.
- Best practice requires significant sorting if Municipal Solid Waste is used as the feedstock.
- Can produce harmful emissions such as particulate matter, fly ash, polycyclic hydrocarbons and poly-chlorinated benzenes and other harmful chemicals which cannot always be captured by filters/ treatment. Many of which cannot be monitored in real time.
- Produces significant quantities of ash which is often sent to landfill.
- Can potentially undermine efforts to reduce, re-use, recycle and avoid waste generation.
- Some community members perceive this as an outdated technology.

Observations

- Parts of industry felt that incineration could be a genuine solution to addressing the problem of residual waste.
- There is an incineration plant being developed in Western Australia.

Policy points

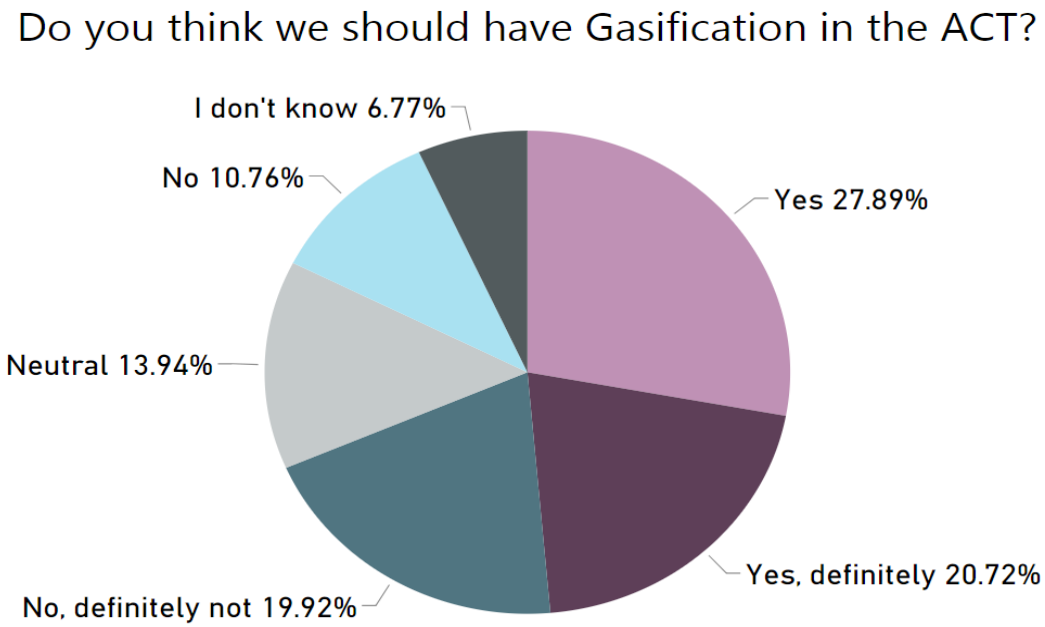
- A ban or moratorium on incineration, and thermal technologies, should be considered.
- Consideration should be given to incineration of medical waste and existing practices, including sewerage treatment.
- The emissions standards relating to any incineration plant should be the strictest possible, with real time monitoring of emissions and genuine regulatory enforcement for breaching emissions standards.
- Should be a significant distance from the nearest residential building or community use.
- Governments should not be locked into long term contracts which are expensive and do not encourage long-term improvements to resource recovery rates.
- Only process residual waste where no other form of reuse or recycling is possible.
- A cost-benefit analysis should accompany any project, including showing that there is a clear benefit to the community over the base case of landfilling.
- Waste should not be imported to fuel an incinerator.

"There are newer and better technologies now available that are cleaner, environmentally friendly and better suit the requirements of the region"

"This is the best of the options by far. Proven, cost-effective and well supported in other countries"

Gasification

Gasification is a thermal treatment technology that heats waste to high temperature using a controlled amount of oxygen to limit burning. The result is a syngas containing carbon monoxide and hydrogen which can be burnt to produce electricity and / or heat.



The survey results indicate that gasification is marginally more supported than incineration. The results as to whether we should have gasification in the ACT were 48.61% respondents saying yes (27.89%) or yes definitely (20.72%) while 30.68% of respondents said no (10.76%) or definitely no (19.92%).

Similar to incineration, face-to-face discussions about gasification indicated there is a high degree of concern about the technical uncertainty of the technology and around the health impacts of emissions and those we spoke to were almost unanimously against allowing gasification to occur.

"Gasification should be a last resort - we should focus on refusing, reducing, reusing and recycling beforehand. There should be a focus on truly renewable electricity sources before Gasification"

"Given the fact the technology hasn't been proven at large scale we should have a trial plant with extremely tight environmental monitoring"

Gasification continued

Face-to-face interactions and comments in survey responses identified some pros and cons to having gasification in the ACT:

Pros

- Is a method for diverting residual waste from landfill.
- Can generate base load electricity.
- Is seen as a slightly more advanced technology than incineration.
- The generated gas can be stored or transported before combustion making it more flexible than incineration which only produces heat which must be used immediately.

Cons

- Is an inefficient way of generating electricity.
- Best practice requires significant sorting if Municipal Solid Waste (MSW) is used as the feedstock.
- Can produce harmful emissions such as particulate matter, fly ash, polycyclic hydrocarbons and poly-chlorinated benzenes and other harmful chemicals which cannot always be captured by filters/ treatment. Many of which cannot be monitored in real time.
- Produces significant quantities of ash which is often sent to landfill.
- Can potentially undermine efforts to reduce, re-use, recycle and avoid waste generation.

Observations

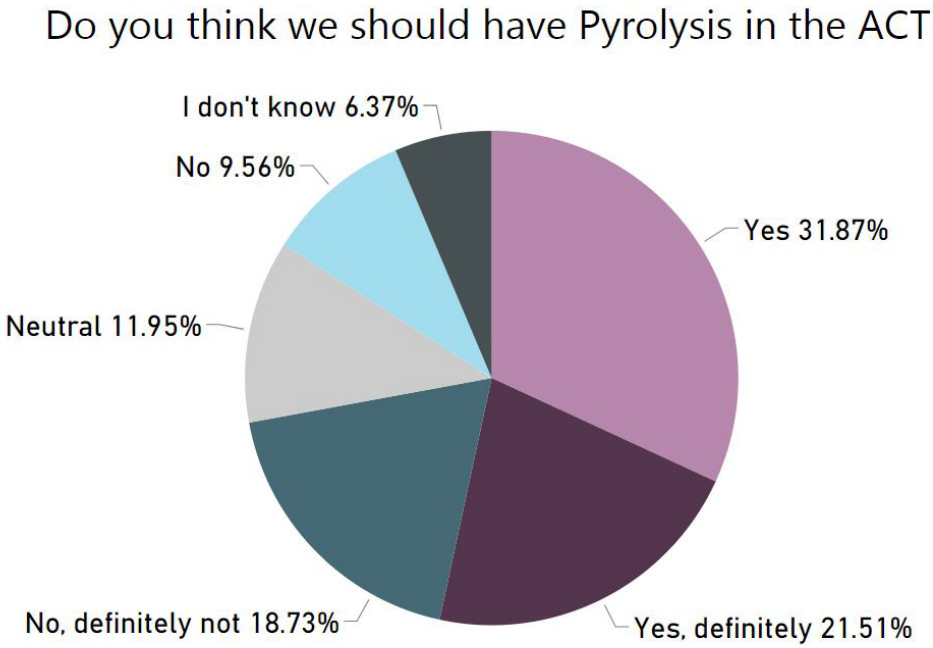
- There does not appear to be agreement between industry and the community about whether gasification is a proven technology. Industry noted that there are several gasification plants operating in Japan.
- There is a gasification project being developed in Victoria.

Policy points

- A moratorium should be considered on thermal technologies, including gasification.
- The emissions standards relating to any gasification plant should be the strictest possible, with real time monitoring of emissions and genuine regulatory enforcement for breaching emissions standards.
- Should be a significant distance from the nearest residential building or community use.
- Governments should not be locked into long term contracts which are expensive and do not encourage long-term improvements to resource recovery rates.
- Only process residual waste where no other form of recycling is possible.
- Parts of industry believe that gasification is a genuine solution to addressing the problem of residual waste such as composite materials which are difficult to recycle.
- A cost benefit analysis should accompany any project, including showing that there is a clear benefit to the community over the base case of landfilling.
- Waste should not be imported to fuel a gasification plant.

Pyrolysis

Pyrolysis is a process that heats residual waste at high temperatures of over 400 degrees Celsius within very low oxygen environments. In the absence of oxygen the materials change composition, leaving a solid residue with a high concentration of carbon (char), as well as liquids and/or gases, which can all be combusted to generate energy.



The survey results indicate that pyrolysis is marginally more supported than gasification. The results as to whether we should have pyrolysis in the ACT were very similar to gasification with 53.38% of respondents saying yes (31.87%) or yes definitely (21.51%) while 24.7% of respondents said no (9.56%) or definitely no (15.14%).

Face-to-face discussions about this technology more closely reflected the survey responses although sentiment towards the process varied depending on the feedstock being used. Organic waste such as garden organics or agricultural residue were seen as more favourable than municipal solid waste.

The creation of biochar from pyrolysis which can be used as a soil conditioner was seen as a benefit by some participants when made from a clean, organic feedstock.

Overall however, due to the thermal treatment involved in the process and the health and environmental risks, face-to-face participants were generally against allowing pyrolysis to occur in the ACT.

Overall, thermal technologies were viewed by focus group participants as equally bad, especially in terms of health outcomes and greenhouse gas emissions. Pyrolysis was often acknowledged to be the best of the thermal technologies because of its potential to produce a biochar soil additive when used on organics.

"This would be great. And what a great end product. Soils in Australia are so depleted"

Pyrolysis continued

Face-to-face interactions and comments in survey responses identified some pros and cons to having pyrolysis in the ACT:

Pros

- Is a method for diverting residual waste from landfill.
- Can generate base load electricity.
- Produces a solid char product which could be used as a soil conditioner.

Cons

- Is not a fully commercially developed process.
- Can produce harmful emissions such as particulate matter, polycyclic hydrocarbons and polychlorinated benzenes and other harmful chemicals which cannot always be captured by filters/ treatment. Many of which cannot be monitored in real time.
- Can potentially undermine efforts to reduce, re-use, recycle and avoid waste generation.

Observations

- Industry participants generally preferred gasification or incineration over pyrolysis.
- Most acceptable of the thermal technologies by community.

Policy points

- A moratorium should be considered on thermal technologies, including pyrolysis (particularly non-organic feedstock).
- The emissions standards relating to any pyrolysis plant should be the strictest possible, with real time monitoring of emissions and genuine regulatory enforcement for breaching emissions standards.
- Should be a significant distance from the nearest residential building or community use.
- Governments should not be locked into long term contracts which are expensive and do not encourage long-term improvements to resource recovery rates.
- Only process residual waste where no other form of recycling is possible.
- A cost benefit analysis should accompany any project, including showing that there is a clear benefit to the community over the base case of landfilling.
- Waste should not be imported to fuel a pyrolysis plant.

Landfill Gas Capture

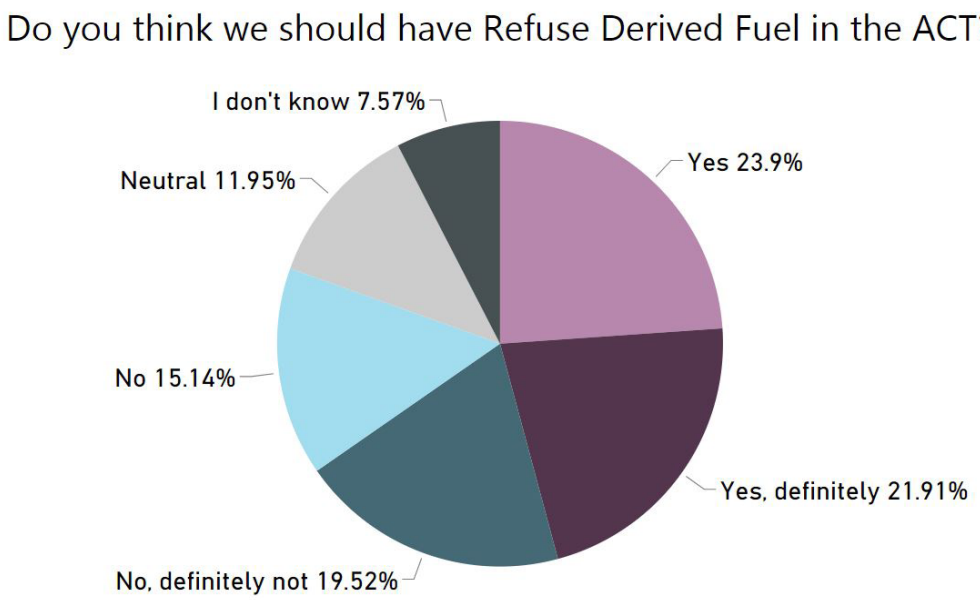
Landfill gas capture is a process where the methane gas generated in landfills is extracted via pipes and combusted to generate electricity and is currently in operation at the Mugga Lane and West Belconnen landfill sites and is powering approximately 5,000 homes.

Landfill gas capture generally was seen by people as a good interim technology and is considered best practice for existing landfills because it captures methane (a potent greenhouse gas), which would otherwise escape into the atmosphere, to generate electricity.

While landfill gas capture is considered appropriate for use at existing landfill sites it is not considered a preferable future option because in future organics should be diverted from landfill, eliminating most of the methane generated.

Refuse Derived Fuels (RDF)

Refuse Derived Fuel (RDF), including Process Engineered Fuels (PEF), is the mechanical pre-treatment of residual waste prior to combustion to produce a specific fuel type. This means that waste can be processed into fuel where it was created but can be transported outside of the ACT to be burnt in other facilities such as cement kilns.



The survey results were also polarised on whether we should have PEF in the ACT with 45.81% of respondents saying yes (23.9%) or yes definitely (21.91%) while 34.66% of responses said no (15.14%) or definitely no (19.52%). Face-to-face interactions and comments in survey responses identified some pros and cons having PEF in the ACT:

Pros

- Diverts residual waste from landfill.
- Can be transported and used in other jurisdictions to displace fossil fuels.

Cons

- Is a form of incineration and hence has all the concerns associated with incineration above.
- There are significant greenhouse gas emissions associated with transporting the PEF.
- Significant effort required to sort and process the fuel.
- Has low calorific value.
- Is seen as making our waste another jurisdiction's problem.

"I am not sure if the cost and energy usage of shredding/ squishing and then transporting (via road?) to another site is environmentally and/or economically worthwhile?

Observations

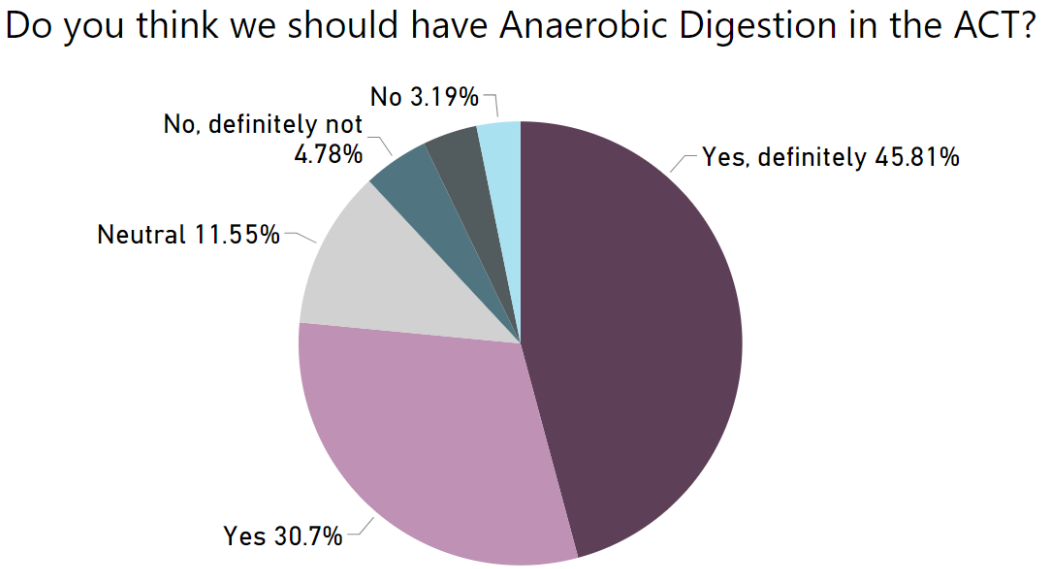
- Investigation into the development of a PEF facility was a recommendation out of the Waste Feasibility Study.

Policy Points

- The jurisdiction where PEF from the ACT is burnt should have the strictest possible air quality standards.
- A cost benefit analysis should accompany any project, including showing that there is a clear benefit to the community over the base case of landfilling.

Anaerobic Digestion

Anaerobic digestion is the process of using micro-organisms to break down biodegradable material in a closed reaction vessel without the presence of oxygen. The products of anaerobic digestion are a biogas primarily composed of methane which can be used to generate electricity and a solid/ liquid digestate which can be used as fertiliser or a soil conditioner. There is no thermal treatment involved in generating the biogas, therefore it is considered a cool technology. This technology can be used to treat the food and garden organics but can not be used for hard or soft plastics, metals or other similar materials.



Anaerobic digestion was the most popular form of waste-to-energy in every form of engagement. The survey result show that 76.5% of respondents saying yes (30.68%), or definitely yes (45.81%) while only 7.97% answered no (3.19%) or definitely no (4.78%). Face-to-face interactions and comments in survey responses identified some pros and cons:

Pros

- Does not produce harmful emissions including particulate matter, fly ash, polycyclic hydrocarbons and poly-chlorinated benzenes and other harmful chemicals.
- Diverts organics from landfills.
- Produces a electricity which composting does not.
- Produces a digestate which can be used as a soil additive .
- Is a well-established technology.

"The additional resource recovery benefits of anaerobic digestion has been identified for food waste by the USA EPA by prioritising anaerobic digestion and technologies that convert food waste into fuel over composting"

Cons

- Can only be used for biodegradable organic waste.
- Is more expensive than other forms of treating organics such as composting.
- There is some potential for methane to leak.
- Waste stream must be very clean.
- Still produces carbon dioxide when the methane is burnt.

Observations

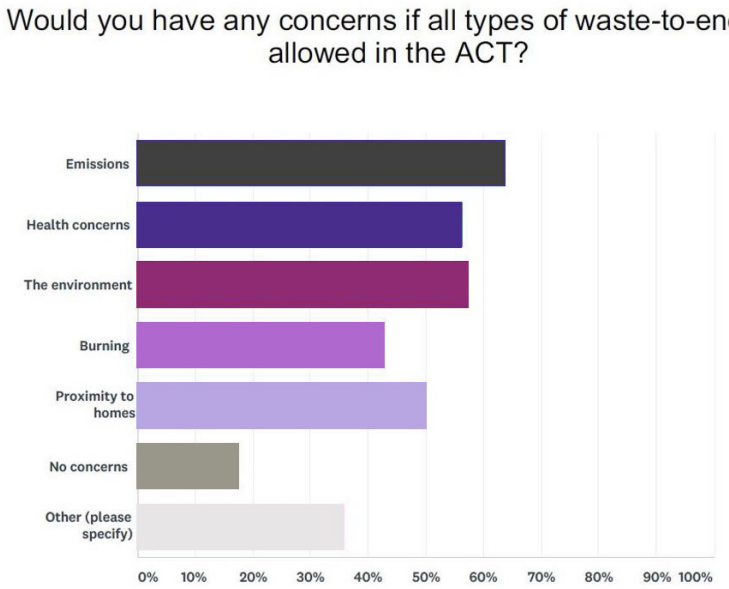
- There are several anaerobic digestion facilities operating across Australia.

Policy Points

- Industry feel this is promising technology but it can be used to treat a particular fraction of the total waste stream.
- A cost benefit analysis should accompany any project showing that there is a clear benefit to the community over the base case of landfilling and the alternative of composting.

CONCERNS

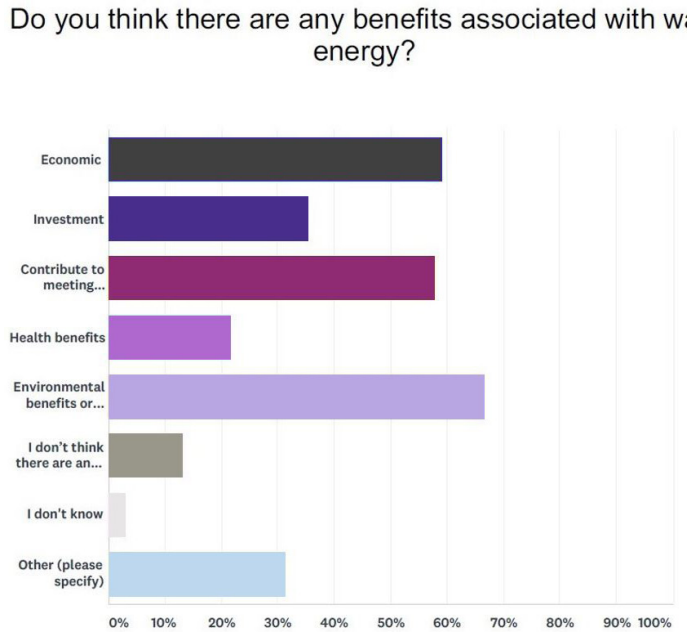
Survey responses showed that the community has significant concerns around waste-to-energy technologies being used in the ACT. Emissions was listed as the number one concern with 63.8% of respondents selecting this options as a concern. The environment (57.4%) and health concerns (56.6%) made up the top three. Other concerns listed in the survey were proximity to homes (49.8%) and burning (42.6%). 17.5% of respondents selected no concerns.



"I am definitely concerned about proximity to homes"

BENEFITS

Survey responses show that 75% of all respondents recognised that there was some benefit to having waste-to-energy in the ACT. Environmental benefits or reduced environmental impacts (66.5%) was seen as the main benefit. Economic benefits (59%) and contribution to meeting resource recovery targets (57.8%) made up the top three. Other benefits which were listed in the survey include investment (32.5%), other benefits (31.5%), and health benefits (21.5%). 13.2% of respondents did not think there were any benefits. Other benefits were recognised such as the opportunity for the ACT to be leaders in innovation, job creation and reduced power bills.

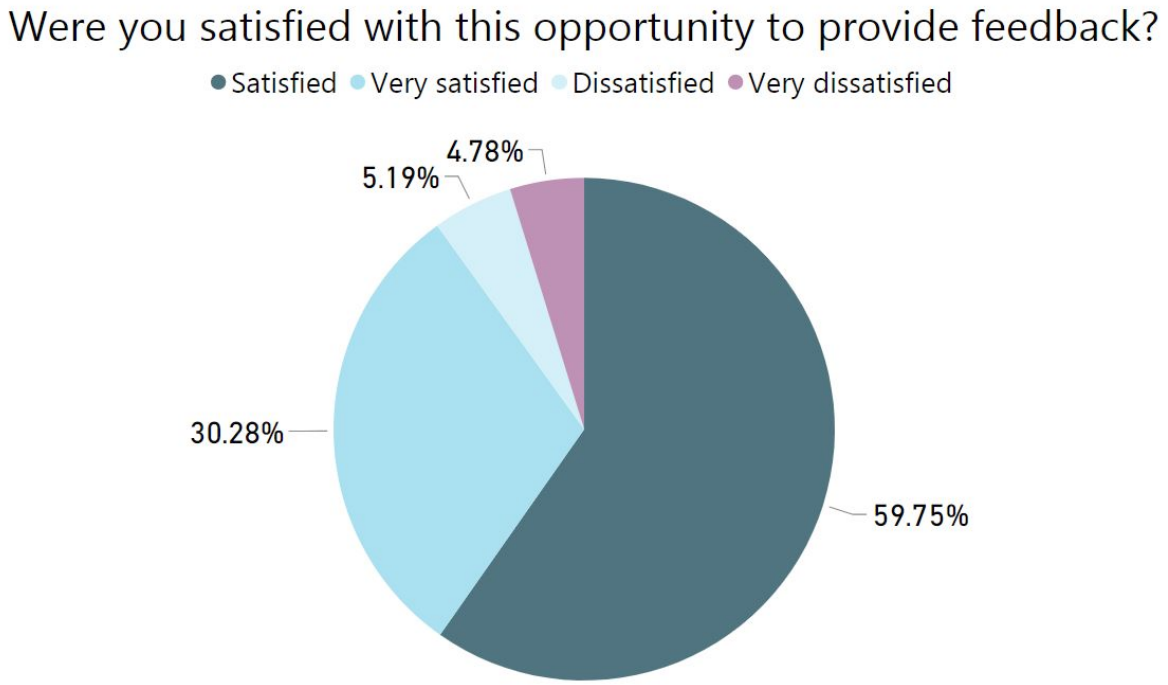


"If done correctly, yes, there are definitely advantages in all the above fields"

ENGAGEMENT SATISFACTION

Feedback received throughout the engagement showed that people who participated through the survey, as well as our many face-to-face engagements including focus groups, one-on-one sessions or information stalls were generally satisfied with the opportunity to provide feedback.

The survey results indicated that over 90% of respondents said they were either satisfied (59.75%) or very satisfied (30.28%) while 9.97% of respondents said they were either dissatisfied (5.19%) or very dissatisfied (4.78%).



WHAT'S NEXT?

TCCS values the community's feedback and would like to thank everyone who participated in the engagement process.

We now have a better understanding of what the community want from a waste-to-energy policy, and this information has been used to develop the policy incorporating as much of what you have told us as possible. You can stay up to date on the project at YourSay.act.gov.au.

Transport Canberra and City Services