

ATTACHMENT A

**SUMMARY OF SUBMISSIONS RECEIVED
DURING THE PUBLIC EXHIBITION PERIOD**

Advanced Waste Treatment Master Plan – Summary of Submissions received during the Public Exhibition Period

Responses from individuals

From	Issue	City Response-Action	Recommended change to the draft
1. Individual A	i. This is a fantastic idea to reuse non-recyclable wastes and reduce the amount of waste that has to go with landfill. I support this plan and would love to see it happen.	Comments noted.	No change.
2. Individual B	i. The future is what Japan has been doing for years; actively separating rubbish into subcategories. The major theme of Japan is applying an active culture to separate for easier recycling. They have biodegradable see-through rubbish bags that are sold in different colours for the different categories. It's not perfect but it works.	Comments noted.	No change.
3. Individual C	i. Great initiative. It would be good to understand why our targets and timeline seem much more conservative than other global cities like San Francisco	Comments noted.	No change.
4. Individual D	i. Absolutely I support this plan which should really be a no-brainer.	Comments noted.	No change.
5. Individual E	i. I commend the City for developing green infrastructure including advanced waste treatment and not putting waste into landfill and instead turning waste to harvest recyclables and produce energy	Comments noted.	No change.

The results of the Community Engagement Workshops with 14 City of Sydney residents are reported in a separate attachment.

Responses from major stakeholders

From	Issue	City Response-Action	Recommended change to the draft
<p>6. Waste Management Association Australia – Resource and Energy Recovery (Energy from Waste subgroup)</p>	<p>i. The EfW subgroup welcomes the City’s progressive approach to waste management and the recognition that energy from waste can play an important part in the processing of the residual waste stream.</p>	<p>Comments noted.</p>	<p>No change.</p>
	<p>ii. Available tonnages noted in the Master Plan are probably not sufficient to be considered viable by investors. Commercial tonnages noted are considerable but unable to secure long term contracts. Additional tonnages from nearby Councils would offer greater security, but the Master Plan does not identify which Councils are currently contracted elsewhere and if any Councils have been approached to contribute waste tonnages.</p>	<p>Comments noted.</p> <p>The City has assessed total waste tonnages available from its local government area (both residential and commercial) as well as surrounding region to inform the Master Plan as to available resources for energy from waste in proximity to the City.</p> <p>Some local region councils have entered term contracts for either landfill or treatment of waste. The treatment option is noted in the Master plan at p. 40. At the time of development of the Master Plan the final form of an available SSROC treatment contract was in part dependent upon a modified consent for a treatment facility and approval of an additional local transfer station.</p> <p>Councils within the local region have expressed interest under the SSROC Regional Waste Strategy in investigating energy from waste options.</p>	<p>New text added to FIGURE 39: POST-RECYCLING WASTE SSROC COUNCILS at p. 40.</p>

From	Issue	City Response-Action	Recommended change to the draft
	<p>iii. If the City is considering a smaller scale facility than the 100,000-150,000 tonnes facility used for financial analysis in the Master Plan, the City should provide further detail.</p>	<p>The Master Plan provides only an indicative financial modelling of a facility able to process between 100,000 to 150,000 tonnes of waste per year. However, the final size of a facility will need to be determined by the best value achieved by a competitive procurement process. Comments noted.</p>	<p>No change.</p>
	<p>iv. The Master Plan does not indicate the mechanism for delivering a facility (contract for design and build; build, own, operate; etc)</p>	<p>The Master Plan reviews available options for the City to achieve the Plan’s objectives, based on known and projected waste levels and composition. As a Master Plan it provides a high level business case to establish a preferred direction for Council, and comments specific to the detail of delivery may be considered during Implementation.</p>	<p>No change.</p>
	<p>v. The Master Plan does not state the level of investment from the City apart from tonnages.</p>	<p>Comments noted and may be considered during Implementation.</p>	<p>No change.</p>
	<p>vi. Is the City prepared to guarantee the identified tonnages for a minimum period of time?</p>	<p>Comments noted. Specifics of guarantees of supply and period of supply would be subject to the outcomes of a procurement process. However, the City has stated in the Master Plan at p. 5 as its first objective that it is seeking to generate a long term sustainable waste solution for the City’s residual waste levels post-recycling.</p>	<p>No change.</p>
	<p>vii. Council should consider more risk sharing in contract models to procure a medium to large scale facility.</p>	<p>Comments noted, and may be considered during Implementation.</p>	<p>No change.</p>

From		Issue	City Response-Action	Recommended change to the draft
	viii.	More detail on the City's selection process such as the "high level risk assessment" and disclosure of the Arup report this was based upon would be helpful.	Comments noted.	New text added within section EVALUATING THE TREATMENT OPTIONS p. 24.
	ix.	Provide a clearer explanation of selection process for the preferred gasification process (high temperature plus ash melting) was selected.	Comments noted.	New text added to Figure 42 on p. 44 New text added within section THERMAL CONVERSION SCENARIOS at p. 45

From	Issue	City Response-Action	Recommended change to the draft
	<p>x. There are assumptions in the energy yield calculations for various gasification technologies that impact on the independence and comprehensiveness of the Gasification Technologies Review.</p>	<p>The assumptions of concern are not identified.</p> <p>The Gasification Technology Review was prepared by a consultancy (Talent with Energy) engaged by due process by the City, using international expertise and knowledge. To provide the City with certainty that the report was fair and accurately represented in the Master Plan, the City commissioned a third party consultancy (KMH Environmental) via competitive quotation to provide a technical review of that report.</p> <p>The conclusions of the Technical Review include the following comments:</p> <ul style="list-style-type: none"> • The choice of a gasification based output process is clearly the most suitable option. • KMH have not found any significant technical factors that would or could lead us [KMH] to conclude that what is proposed in the City of Sydney's AWT Master Plan is technically unviable to implement. <p>Talent with Energy also provided the detailed appendix for the City's Renewable Energy Master Plan.</p>	<p>No change.</p>

From	Issue	City Response-Action	Recommended change to the draft
	<p>xi. Production of a clean syngas able to be used in reciprocating engines is not in evidence commercially anywhere except Japan.</p>	<p>The Master Plan identifies 16 reference technologies. All of the technologies identified operate using municipal solid waste as part of the feedstock, as similarly proposed for City waste in the Master Plan.</p> <p>Of the nine facilities in the “High temperature plus ash melting” category, eight facilities are at “commercial” or “proven” stage. Six of these facilities are located in Japan, as the comment notes.</p> <p>The other two commercial technologies operate outside Japan. The reference technology by Inentec in Taiwan and USA has operated dual-fuelled generator sets using the syngas. The reference technology Plasco in Canada has generated syngas sufficiently clean to operate Jenbacher reciprocating engines.</p>	<p>No change.</p>
	<p>xii. Current EPA policy requires proven technologies to be used for an Energy from waste facility. How does the City intend to manage the proven status of its technology when presenting environmental submissions?</p>	<p>Comments noted, and may be considered during Implementation.</p> <p>The EPA policy also refers to technologies being “well understood and capable of handling the expected variability and type of waste feedstock”.</p> <p>Refer also to the City response at point xi. Some of the reference technologies have had facilities operating commercially for a period of 10 years.</p>	<p>No change.</p>

From	Issue	City Response-Action	Recommended change to the draft
	<p>xiii.</p> <p>The current EPA policy restricts the level of feedstock from municipal solid waste to 40% unless higher levels are permitted by EPA based on the City's collection system. The EFW subgroup recommend that the City include comment in the Master Plan calling for greater flexibility in the NSW EPA policy.</p>	<p>Comments noted.</p> <p>The Energy from Waste Policy Statement allows for consideration to be given to increases in the maximum allowable percentage of waste that can be used in a facility where the organic component of that waste is to be used for energy recovery and best available technologies are demonstrated to be used.</p> <p>The City is discussing its approach with the NSW EPA to evaluate likely allowances.</p> <p>The City has called for a National Energy from Waste policy approach within Enabling Action 4 to standardise the requirements for energy recovery facilities to avoid influencing the market to concentrate in the state with the least prescriptive energy from waste policy.</p> <p>Comments noted.</p>	<p>New text added to section NSW ENERGY FROM WASTE POLICY STATEMENT at p. 49.</p>
	<p>xiv.</p> <p>The EFW subgroup call for inclusion of comment in the Master Plan seeking a "waste infrastructure advocate" within the NSW government supporting energy from waste type projects.</p>	<p>Comments noted.</p>	<p>New text added within ENABLING ACTION 4, at p.86</p>
	<p>xv.</p> <p>The EFW subgroup identifies location of site as key to delivery of a facility. What work has been done by the City to estimate the ability of gas injection points to accept the syngas in the proportions modelled, what modifications may be required and at what cost (estimate)? Does the City intend to lead or assist with negotiations with the gas company? Will the City be in a position to assist with funding for any modifications?</p>	<p>Comments noted, and may be considered during Implementation.</p> <p>The Master Plan includes as an Enabling Action the refinement of criteria for selecting suitable potential locations for a facility. This was done to allow the community the opportunity to have input on what is considered the necessary criteria the City should apply when considering suitable sites.</p>	<p>New text added within ENABLING ACTION 1, at p. 84</p>

From	Issue	City Response-Action	Recommended change to the draft
	<p>xvi. Based on existing research has the City defined what it considers to be close proximity to the City or source of waste? Is there a maximum distance from the City or the gas pipe network at which the environmental or economic advantages of this particular technology type are no longer viable?</p>	<p>Comments noted, and may be considered during Implementation.</p> <p>The City supports the application of the proximity principle of sustainability to waste management. This would mean managing waste as close as viable to the point of generation of that waste.</p> <p>There are a number of variables including distance, available transport corridors, transport modes (truck or train), the use of transfer stations to aggregate loads, and impact on amenity that combined preclude a single prescriptive definition of 'close proximity' in the Master Plan.</p> <p>The City's Renewable Energy Master Plan previously calculated a capital cost factor for a facility to include delivery operations and this is addressed again in Figure 70, p. 75 of the Advanced Waste Treatment Master Plan.</p>	<p>No change.</p>
<p>7. Southern Sydney Regional Organisation of Councils</p>	<p>i. The Master Plan offers significant opportunities for the Southern Sydney region.</p>	<p>Comments noted, and may be considered during Implementation.</p>	<p>No change.</p>
	<p>ii. It will be challenging for the NSW government to meet targets in its <i>NSW Waste and Resource Recovery Strategy 2013-21</i> without innovation such as the City of Sydney proposal.</p>	<p>Comments noted.</p>	<p>No change.</p>

From	Issue	City Response-Action	Recommended change to the draft
	<p>iii. The proposed staged implementation plan allows for ongoing leadership and learning for the NSW government, the waste sector, and the community in order to obtain the crucial social licence to operate resource recovery infrastructure.</p>	<p>Comments noted.</p>	<p>No change.</p>
	<p>iv. The Master Plan demonstrates ongoing leadership by the City in the renewable energy sector.</p>	<p>Comments noted. The City will continue its leadership and information role within the Regional Waste Strategy energy from waste sub-group.</p>	<p>No change.</p>
	<p>v. SSROC councils are active in this area and fully support the City's proposal.</p>	<p>Comments noted.</p>	<p>No change.</p>
<p>8. Office of the NSW Small Business Commissioner</p>	<p>i. The OSBC supports the proposed introduction of an Advanced Waste Treatment facility to reduce the costs of waste disposal.</p>	<p>Comments noted.</p>	<p>No change.</p>
	<p>ii. The OSBC emphasises the need for active stakeholder, community and business engagement for successful implementation. Particularly engage with all stakeholders to develop specific criteria to guide the selection of an appropriate location for the facility.</p>	<p>Location criteria and stakeholder engagement on the content of these criteria is addressed in the Master Plan as Enabling Actions 1 and 2. City has commenced the engagement process with its local community and will continue to engage relevant stakeholders as part of the Implementation Plan subject to Council endorsement of the Master Plan.</p>	<p>No change.</p>

From	Issue	City Response-Action	Recommended change to the draft
iii.	<p>Consideration in location criteria should be directed to impacts of</p> <ul style="list-style-type: none"> • increased road traffic • increased road degeneration • environmental concerns • additional costs to local businesses passed on by the local council • reduction in tourism • reduction in business development opportunities for the locality • ensure re-direction of vehicles from existing waste facilities does not increase congestion, transport times and negatively impact local community 	Comments noted.	New text added within ENABLING ACTION 1, at p. 84.
iv.	Seek to deliver community benefits by utilising the energy from the proposed facility for subsidised energy to local community including sport and educational activities.	Comment noted.	New text added within ENABLING ACTION 2, at p. 84.
v.	Consider a site in close proximity to the City of Sydney CBD to reduce the carbon footprint from transport of waste.	<p>Comment noted.</p> <p>Already included as a criteria within Enabling Action 1.</p>	No change.
vi.	Encourages the City to continue to liaise with NSW government and industry representatives to ensure broad community and industry awareness.	<p>Comment noted.</p> <p>Already acknowledged within Enabling Action 2.</p>	No change.

From	Issue	City Response-Action	Recommended change to the draft
vii.	The OSBC recommends that the City keep any increase in business compliance costs reasonable and consistent with efficient well-managed waste management processes.	<p>Comment noted.</p> <p>The draft Master Plan does not envisage increased compliance cost for local business. Any use of the proposed facility would be a voluntary business decision.</p>	No change.
viii.	The Master Plan when endorsed should be clearly communicated and explained to businesses and the community. Businesses should be made aware of any impacts on their operations and current waste removal processes.	<p>Comment noted, and may be considered during Implementation.</p> <p>Already acknowledged in Enabling Action 2.</p> <p>No direct impact envisaged in the Master Plan on local business operations except by voluntary business decision to use a facility.</p>	No change.
ix.	To encourage increased recycling and sustainable disposal of waste, the City should continue to reflect existing fees and penalty structures on current waste controls at landfill sites.	Existing controls including a levy on residual waste disposed to landfill is part of NSW government legislation. The City will continue to encourage recycling as part of its waste strategy.	No change.
x.	The OSBC recommends the City seek to treat all domestic and commercial waste from the City's LGA to deliver long term economic benefits in reduced waste levy payments from businesses and council.	Comment noted.	No change.
xi.	The City should consider the impacts on local waste disposal and transportation businesses including compliance costs in order not to impose additional costs on local businesses for waste management.	<p>Comment noted.</p> <p>The Master Plan does not envisage any additional compliance costs for waste disposal and transportation businesses. The facility location criteria of proximity to the source of waste is anticipated to allow minimisation of transport impacts if achieved.</p>	No change.

From		Issue	City Response-Action	Recommended change to the draft
9. Total Environment Centre	i.	The TEC opposes the plan as contrary to the waste hierarchy and seeking to undermine the NSW Waste to Energy Policy.	<p>The Master Plan proposes to treat residual waste after viable recycling operations are carried out. No reduction in the City's commitment to recycling is envisaged in the Master Plan.</p> <p>The waste hierarchy includes energy from waste as a higher order tier than landfill disposal, and therefore the Master Plan encourages better practice solutions fully based on and consistent with the waste hierarchy.</p> <p>The City notes that the NSW EPA in its submission states "The use of non-recyclable waste that would otherwise end up in landfill as proposed in the Advanced Waste Treatment Master Plan is consistent with the EPA's <i>NSW Energy from Waste Policy Statement</i>."</p> <p>The Master Plan states at p. 49 that the City will manage its waste in accordance with the NSW Energy from Waste Policy Statement.</p>	No change.

From	Issue	City Response-Action	Recommended change to the draft
	<p>ii. Selecting 'diversion from landfill' as the key indicator contaminates the task of maximising recycling and re-use, which are higher value than energy generation.</p>	<p>Comment noted.</p> <p>The figures used to determine the levels of diversion of waste from landfill include all higher order waste management options in the waste hierarchy, including re-use, recycling and energy recovery.</p> <p>The City's Interim Waste Strategy is based on diversion of waste from landfill and places a higher emphasis on avoidance and reuse than recycling, in accordance with the <i>NSW Waste Avoidance and Resource Recovery Act 2003</i>.</p> <p>In the next version of the Waste Strategy the City will consider the inclusion of recycling and preparation for reuse targets and monitoring of these to demonstrate our ongoing commitment to improving material recovery prior to energy recovery.</p> <p>Energy recovery is a tier in the waste management hierarchy following recycling, and so as an indicator it is appropriate to define its benefits in terms of diversion of waste from landfill disposal.</p>	<p>New text added within section WHY TREAT WASTE? At p. 18.</p>

From	Issue	City Response-Action	Recommended change to the draft
	<p>iii.</p> <p>The Master Plan does not appear to accept the new NSW state targets of 70% recycling for residential and 70% recycling for commercial, nor does it acknowledge the NSW target of 75% 'diversion from landfill'.</p>	<p>The Master Plan sets a preference for diversion of waste including recycling at the level of 95%.</p> <p>The Master Plan sets a preference for diversion of waste including recycling at the level of 95%.</p> <p>The draft <i>NSW Waste Avoidance and Resource Recovery Strategy 2013-2021</i> remains in draft-only at the date of this report to Council. The City provided a submission to the NSW EPA on the draft strategy in October 2013. The City acknowledges the draft State-wide targets set out in the proposed strategy, noting however that these may be altered within the final released version.</p>	<p>New text added within section DRAFT NSW WASTE AVOIDANCE AND RESOURCE RECOVERY STRATEGY 2013-21 at p. 49.</p>

From	Issue	City Response-Action	Recommended change to the draft
	<p>iv. The Master Plan does not adopt any intention to increase recycling from commercial sources, instead preferring to treat it as an energy source.</p>	<p>The City has no contractual control or legislated obligations allowing it to manage commercial waste.</p> <p>However, the City is working with the Better Building Partnership (which owns 51 per cent of commercial office space in the City CBD) to improve recycling from commercial sources. The Better Building Partnership has released a consultation draft of <i>Guidelines for Operational Waste</i> with the aim of driving continuous improvement in commercial waste recycling and recovery (August 2014).</p> <p>The Master Plan modelled commercial waste levels based on existing recycling levels in order to determine the availability and scale of potential feedstock from sources within the local government area, and to assess the positive greenhouse gas reduction benefits available for local businesses. The modelling was undertaken to understand the potential volume of the feedstock as an input to the feasibility of a waste-to-energy plant. It does not reflect a view that the current level of recycling is desirable, or that commercial waste should be considered as an energy source instead of a resource to be recycled where viable.</p>	<p>No change.</p>

From	Issue	City Response-Action	Recommended change to the draft
	<p>v. The Master Plan directly attacks the NSW Waste to Energy Policy as too prescriptive.</p>	<p>The City supports the NSW Waste to Energy Policy.</p> <p>Both the EPA and the City share concerns to ensure that energy recovery is an extension of recovery processes, and does not ‘cannibalise’ material from recycling activities.</p> <p>The City’s submission and Master Plan observed that in comparison to other energy from waste policies adopted in Victoria and Western Australia, the NSW policy was “unnecessarily prescriptive” (p. 49), arguing that careful licencing of facilities by regulators could achieve better results.</p> <p>The City is satisfied with the additional flexibility the EPA has added to the policy following submissions and consultation. The City is currently in discussions with the EPA to ensure any future City waste-to-energy plant will be consistent with the NSW Waste to Energy Policy.</p> <p>City notes in the Master Plan at p. 49 that it will accommodate the Policy.</p>	<p>No change.</p>

From	Issue	City Response-Action	Recommended change to the draft
	<p>vi. The City's plan encourages a situation where contractual arrangements will create a loss of recoverable value by diverting waste away from recycling with higher resource recovery value.</p>	<p>The financial, technical and environmental benefits within the Master Plan are modelled on levels of recycling consistently rising to 2030. Specifics of future potential contractual arrangements are beyond the scope of the Master Plan. However, the City does not envisage any reduction of its effective recycling systems, especially given that they provide a positive revenue return for Council for material.</p>	<p>No change.</p>

From	Issue	City Response-Action	Recommended change to the draft
	<p>vii. The TEC recommends the City recalibrate its approach to conform to its stated desire to be environmentally sustainable. TEC acknowledge that energy generation may assist greenhouse gas abatement but recycling and reuse do more.</p>	<p>The Master Plan is supportive of the waste hierarchy. The sustainability outcomes of the Master Plan already include the benefits of recycling, but the improved greenhouse gas abatement outcomes arise from additional benefits of recovering energy from non-recyclable waste.</p> <p>The City notes that the Master Plan sets out how to provide a largely renewable energy supply for the City as part of a suite of integrated Decentralised Energy Master Plans, as well as meeting improved environmental outcomes by reduced waste disposal to land. In addition to greenhouse abatement, there are environmental benefits to avoiding natural and coal seam gas production. The Master Plan also notes that if diversion from landfill is not accelerated, Sydney will require a new landfill which would have significant environmental impacts.</p> <p>The Master Plan notes at p. 17 and p. 69 that by converting non-recyclable waste to energy for local energy consumption, the City could avoid 87 tonnes of waste (coal ash) for every gigawatt of electricity currently supplied using coal power. This level of waste avoidance could reach hundreds of thousands of tonnes of material no longer disposed into the environment.</p> <p>Comments noted.</p>	<p>No change.</p>
10. Sydney Water	<p>i. The Draft Advanced Waste Treatment Master Plan presents an exciting vision and commitment to a more sustainable future for Sydney.</p>	<p>Comments noted.</p>	<p>No change.</p>

From	Issue	City Response-Action	Recommended change to the draft
ii.	Co-digestion of waste organics with waste water sludge was not considered in the Master Plan, although anaerobic digestion was considered.	Comments noted, and may be considered during Implementation. Discussion will continue with Sydney Water in regards to renewable energy generation from these additional waste resources.	No change.
iii.	The carbon footprint of the option for Anaerobic Digestion (AD) plus Gasification at page 8 could be even lower if co-digestion was included as the process. AD is sensitive to the quality and consistency of source separated organics but this is mitigated by the homogeneity of waste water sludge in co-digestion.	Comment noted. This position is in agreement with the City's preferred options in the previous <i>Renewable Energy Master Plan</i> .	No change.
iv.	Sydney Water has 11 anaerobic digestion sites and are well connected to the gas grid. Using the existing natural gas network avoids additional cost of gas transport from remote sources.	Comment noted. This position is in agreement with the City's preferred options in the previous <i>Renewable Energy Master Plan</i> .	No change.
v.	After waste water treatment, around 500 TJ of energy potential remains in the biosolids Sydney Water sends for use as agricultural fertiliser. An alternative process could involve gasification. Sydney Water has assessed gasification of biosolids separately and found more cost effective solutions exist. The incorporation of other dry waste prior to gasification may alter that assessment.	Comment noted, and may be considered during Implementation.	No change.
vi.	The City's comment in Chapter 2 that its prevailing level of organic waste in the mixed waste bin is low (hindering mechanical biological treatment) could be addressed by combining with adjoining Councils.	Comment noted. The City has an individual contract with its current processor.	No change.

From	Issue	City Response-Action	Recommended change to the draft
	<p>vii. Sydney Water does not understand the Master Plan assertion that Anaerobic Digestion will leave a high level of residual waste.</p>	<p>The Master Plan addresses the resource recovery potential of mixed waste collected from households after recycling.</p> <p>If this mixed waste is separated post-collection to derive an organic rich fraction suitable for Anaerobic Digestion, then the remaining waste materials have limited resource recovery options and a high proportion require landfill disposal. This approach is similar to the current use of Mechanical Biological Treatment by the City, which while helping the City achieve 66-68% diversion, still leaves the remaining third of waste with no current option but disposal to landfill. An objective of the Master Plan was to significantly increase diversion from landfill.</p>	<p>No change.</p>
	<p>viii. Is gasification the most sustainable way to extract renewable energy from the organic waste? Is it possible for the inorganic waste to be gasified separate to the co-digestion of organic waste? Alternatively, it may be possible for inorganic waste to be mixed with our biosolids for gasification.</p>	<p>Comment noted, and may be considered during Implementation.</p> <p>Co-digestion and anaerobic digestion had been considered in the early stages of developing the Master Plan. The urban density of the City makes the introduction of any additional source separation for organics exceedingly difficult for residential waste.</p> <p>The inclusion of biosolids with inorganic waste may be viable and would increase levels of renewable gas.</p>	<p>No change.</p>

From	Issue	City Response-Action	Recommended change to the draft
<p>11. Plastic Forests Pty Ltd</p>	<p>i. If implemented, the Master Plan will hamper recycling in the City of Sydney for years to come. By leveraging from the small level of City's residential waste to then include a larger amount of waste from nearby Councils and commercial sources, the City risks removing the incentive from businesses to improve their own recycling. This will lead to a lock-in to a "take-make-waste" pattern.</p>	<p>The Master Plan financial, technical and environmental benefits are modelled on levels of recycling consistently rising to the limit year of 2030.</p> <p>The contracting of waste from nearby Councils and businesses are outside the control of the City. Specifics of contractual arrangements are beyond the scope of the Master Plan.</p> <p>Specifics of future potential contractual arrangements are beyond the scope of the Master Plan. However, the City does not envisage any reduction of its effective recycling systems, especially given that they provide a positive revenue return for Council for material.</p> <p>The Better Building Partnership (with the City of Sydney as a member) has released in August a consultation draft of <i>Guidelines for Operational Waste</i> with the aim of driving continuous improvement in commercial waste recycling and recovery.</p>	<p>New text added within section WHY TREAT WASTE? At p. 18.</p>

From	Issue	City Response-Action	Recommended change to the draft
	<p>ii. The Master Plan claims a reduction of 0.032 MtCO₂-e from avoiding the landfill of 27,000 tonnes of residual waste in 2030. The greenhouse emissions factor applied is the rate for untreated municipal solid waste, and the carbon emission of treated waste (current BAU) should be only around half that amount. This would mean the City is only avoiding around 0.016 MtCO₂-e, a small amount for a large capital expenditure.</p>	<p>The Master Plan states that in addition to greenhouse gas reduction from renewable gases for City consumption, renewable electricity delivery, that there are additional savings to be accounted from the recycling of waste and avoided landfill emissions (at p. 12 and p. 70). These additional savings were not included in the preceding Renewable Energy Master Plan. Using National Greenhouse Office factors, these additional savings only for avoided landfill emissions are determined at 0.032 MtCO₂-e for residential waste.</p> <p>There are no factors provided for the residues of treated waste, and the City's carbon neutral audits rely on the published National Greenhouse Office factors. The City calls in Enabling Action 6 for refined default values for post-AWT waste. By avoiding landfill and its associated emissions, the City also avoids payment of the levy for waste disposed to landfill, calculated to be around \$3.9 million per year by 2030 based on existing levy rates.</p>	<p>No change.</p>

From	Issue	City Response-Action	Recommended change to the draft
	<p>iii.</p> <p>The claim that the level of C&I waste generated in the City, if diverted to the proposed waste to gas facility could avoid 0.196 MtCO₂-e assumes commercial landfills have no landfill gas capture and use. The Horsely Park project could demonstrate a better abatement than assumed C&I baseline.</p>	<p>The City did assume a landfill gas capture rate and a factor was included in modelling of the comparative baseline emissions from landfill. An additional oxidation of methane factor was also used in the calculations.</p> <p>The figure of 0.196 MtCO₂-e is the additional reduction below 2006 levels of greenhouse gas emissions each year from avoided landfill emissions for all LGA waste (both residential and commercial).</p>	<p>No change.</p>
	<p>iv.</p> <p>The multi criteria analysis (Figure 2, page 7) does not evaluate recycling of plastics, paper , or food.</p>	<p>The impact of recycling of paper, plastics, glass and metals were considered within the Life Cycle Analyst as noted in the Master Plan at p. 26. The multi-criteria analysis was provided by the consultancy Arup and based in part on the multi-criteria assessment of alternative waste technologies provided by the NSW EPA. As a technology assessment it was predicated on the treatment of residual waste after recycling operations already conducted, and not intended to be a multi-criteria analysis of a broader waste strategy.</p>	<p>No change.</p>

From	Issue	City Response-Action	Recommended change to the draft
v.	<p>No consideration is given to upgrading Councils current treatment solution (mechanical-biological treatment) with current provider.</p> <p>SITA has published an EIS for expansion of operations at the Kemps Creek facility using similar technology to the existing Global Renewables plant at Eastern Creek.</p> <p>The Master Plan also suggests that implementing separate food waste collections would mean the waste could not be treated in existing Sydney MBT facilities.</p>	<p>Comment noted.</p> <p>SITA has withdrawn the planning application for an expansion modification for the Kemps Creek facility.</p> <p>As the Master Plan identifies at p. 16 there remains a limited capacity for processing waste in the Sydney region with a shortfall of over 2,000,000 tonnes per annum.</p> <p>The Master Plan identifies that the City has a low organics waste stream in comparison to the Sydney Metropolitan Average. Should this level be reduced by additional collections reducing that viable level, the City will likely face additional charges for delivery of its material, such that the economics of using existing facilities may no longer be viable for the City. The City currently must also contribute to the waste levy costs on any material sent to landfill after processing.</p>	<p>No change.</p>
vi.	<p>The Master Plan does not consider what might be done to improve capture of recyclables in the yellow bin.</p>	<p>Comment noted.</p> <p>The Master Plan specifically encourages preserving and improving the residential kerbside recycling system. Improvements to capture of recyclables are outside the scope of the Master Plan which deals with non-recyclable waste, and this may be addressed in a forthcoming update to the existing Interim Waste Strategy.</p>	<p>No change.</p>

From	vii.	Issue	City Response-Action	Recommended change to the draft
		<p>The commercial success of a large facility for energy from waste is risky. C&I waste is not capable of being locked in to forward contracts in significant quantities.</p>	<p>Comment noted, and may be considered during Implementation.</p> <p>While direct from source commercial waste may not typically provide for long term contracts, facilities accepting or sorting commercial waste may enter longer term contracts for aggregated residuals from their processes.</p> <p>The Master Plan also identified other sources of C&I waste that would support recycling initiatives, such as using “shredder flocc” from metals/whitegoods recycling facilities as feedstock.</p>	<p>No change.</p>

From	Issue	City Response-Action	Recommended change to the draft
	<p>viii. It is disappointing that the City has not provided a sustainable vision. Is the future of urban waste management really in super-high tech thermal waste processes? Does it make sense to burn plastics worth \$2,000 per tonne as if they were fossil fuels worth \$100 per tonne? Can we justify using fossil fuel (plastics) to burn the organic nutrients (food and garden waste) that we need to feed future generations? The organic waste from the City is best returned to Australian agricultural soils which have suffered continuous decreases in soil organics since industrial farming commenced.</p>	<p>The Sustainable Sydney 2030 Plan documents the City's sustainability vision.</p> <p>The future of improved waste management resides in a complex interacting mix of legislation and policies, individual consumption and disposal behaviours, industry-based take-back schemes such as Container Deposit schemes, recycling facilities for separated materials, processing facilities for mixed materials recovery, and the recovery of the remaining energy resources for local benefit.</p> <p>Council has a financial incentive to recycle as much as possible as gasification is a more expensive waste management option than recycling programs. However, there is a point where the marginal cost to recover further materials is prohibitively difficult and a significant expense compared to Advanced Waste Treatment. The Master Plan focusses on the treatment options for the fraction of waste that cannot be effectively and efficiently recycled.</p> <p>Current food and garden organic recovery using mechanical biological treatment by the City is recovering around 21% of waste (out of possible 36%) and is suitable for restricted use such as mine site rehabilitation, not agriculture. The City's level of garden waste in the mixed waste stream is extremely low (around 3% by weight) and is already served with a separate collection.</p> <p>The Master Plan proposes to convert mixed waste containing these levels of organics into gas, not to burn nutrients but to deliver a largely renewable resource fuel offering the ability to deliver base-load energy in order to achieve a sustainability target of 70% greenhouse gas reduction by 2030.</p>	<p>No change.</p>

From	Issue	City Response-Action	Recommended change to the draft
12. SITA Australia Pty Ltd (City's current AWT contractor)	i. SITA recognise the City of Sydney as an innovator in waste management and strongly support the Master Plan's objectives of producing Energy from Waste to reduce greenhouse gas emissions, reduce waste going to landfill and provide renewable energy to fuel Sydney. SITA believes Energy from Waste (EfW) facilities will play an essential role in future efforts to reduce waste and increase resource recovery.	Comments noted.	No change.
	ii. The Master Plan describes a number of site location constraints. Meeting these requirements will present a significant challenge in locating a suitable site within the Sydney metropolitan basin.	Comments noted, and may be considered during Implementation.	No change.
	iii. Guaranteeing commercial quantities of C&I material as feedstock to an energy from waste facility may be difficult given differing expectations on waste diversion.	Comments noted, and may be considered during Implementation.	No change.
	iv. The NSW Energy from Waste Policy Statement encourages technologies that are proven, well understood and capable of handling the expected variability and type of waste feedstock. The Master Plan identifies gasification as the preferred waste treatment technology. A number of Japanese gasification projects are cited in the plan, however SITA considers that there are different economic drivers in Japan and therefore these projects cannot be easily replicated in the Australian context.	The City's Master Plan identifies 16 gasification technologies that meet the City's selection criteria for reference technologies. Of the nine facilities in the "High temperature plus ash melting" category, eight facilities are at "commercial" or "proven" stage. Six of these facilities are located in Japan. Acknowledging that the economic drivers are different across most international jurisdictions, the technologies remain proven at the commercial scale and for the type of material suited for City of Sydney objectives.	No change.

From	Issue	City Response-Action	Recommended change to the draft
	<p>v. The City of Sydney’s proposed waste to gas facility is an ambitious and commendable long-term waste solution however SITA considers that as the upgrading of syngas to methane hasn’t been industrially proven, it will be a number of years before the facility can begin operations.</p>	<p>Comments noted, and may be considered during Implementation.</p> <p>The upgrading of syngas to substitute natural gas quality has been industrially proven. The Master Plan provides a case study of the Gobigas facility in Sweden, converting syngas to substitute natural gas which is injected into the gas grid. Syngas from coal gasification upgraded to substitute natural gas has been industrially proven in USA (since the 1980s) and in China, where at Xinghua the world’s largest SNG plant has been in operation for a year delivering over 1 billion cubic metres of substitute natural gas from syngas.</p> <p>However, the use of a syngas derived from municipal solid waste feedstock has not been utilised in a commercial energy from waste plant, although there are a number of available technologies for conversion of syngas to substitute natural gas.</p> <p>The City has noted in the Master Plan that energy recovery using gasification allows for multiple options along a staged process to its optimal long-term waste solution. A procurement process will identify in detail the capacity of the market to deliver a syngas of suitable quality for conversion to substitute natural gas. The case studies in the Master Plan identify a number of commercial technologies capable of providing syngas to that quality.</p>	<p>No change.</p>

From	Issue	City Response-Action	Recommended change to the draft
	<p>vi. Greater diversion from landfill could be achieved through further processing of the Council's waste to produce Processed Engineered Fuel (PEF). [PEF is a fuel derived from mixed waste after sorting and removal of inert and most high moisture organics material]. PEF can be used as a fuel substitute for coal and gas in high combustion facilities. SITA intend to construct a PEF manufacturing facility at Chullora targeting C&I waste.</p>	<p>Comments noted, and may be considered during Implementation.</p> <p>Comparative data were not provided with the submission.</p> <p>The City notes that the submission does claim a 90% diversion of waste for commercial waste processed into PEF. This level is below the levels identified for high temperature thermal conversion reactors. In addition, the quality of energy will alter, with the City seeking a gas with around 65% renewable gas content. The renewable gas content of PEF is not stated, but removal of organics would be expected to impact this level significantly.</p>	<p>No change.</p>
<p>13. New Energy Corporation Pty Ltd</p>	<p>i. New Energy is a leading Australian Energy from Waste (EFW) technology supplier and project development company with the worldwide (ex-Americas) licence for the Entech 'Waste to Gas' low temperature gasification technology developed in Australia.</p>	<p>The New Energy licenced technology Entech is included as one of the 16 reference technologies in the Master Plan scenarios.</p>	<p>No change.</p>
	<p>ii. New Energy is very supportive of the vision to produce renewable gases by utilising mixed waste resources and acknowledges the level of research that has gone into producing one of the better reviews on the range of gasification technologies. The strategy adopted by the City in broad stakeholder engagement has been very constructive and will result in constructive feedback, more understanding and positive acceptance of the Plan. New Energy are excited by the vision and leadership the City has shown in putting together this Plan and will be actively supporting the goals from its position in the Energy from Waste sector.</p>	<p>Comments noted.</p>	<p>No change.</p>

From	Issue	City Response-Action	Recommended change to the draft
iii.	<p>Financial institutions are willing to provide debt funding to the project provided there are long term waste and power contracts in place and there is a proven track record of the technology's performance.</p> <p>As the City could only provide 30% to 50% of the waste volumes of the estimated commercial sized plant, it is unclear in the plan how this obstacle will be overcome.</p>	<p>Comments noted, and may be considered during Implementation.</p>	<p>No change.</p>
iv.	<p>Considering the current national interest in gas prices, the gas market may provide an opportunity for an attractive PPA but this is subject to the quality of gas being sufficient for grid injection. Due to the technology innovation required to firstly produce a quality syngas then to upgrade the syngas into a substitute natural gas (SNG) that can be injected into grid, this may be an area that falls outside the risk profile of lenders.</p>	<p>Comments noted, and may be considered during Implementation.</p>	<p>No change.</p>
v.	<p>A more detailed commercial risk analysis by a leading financial institution may be useful to be included in the Plan to give the City and potential project developers more confidence that the outcomes will be achieved.</p>	<p>Comments noted, and may be considered during Implementation.</p>	<p>No change.</p>
vi.	<p>Siting of an EFW facility is a particular issue that ought to be addressed to give potential project developers the confidence that there is an appropriately zoned and locally community supported site so there will be a greater willingness to participate in a procurement process. New Energy acknowledges that the City has included this as an enabling action.</p>	<p>Comments noted, and may be considered during Implementation.</p>	<p>No change.</p>
vii.	<p>Waste infrastructure development is also a high risk area and traditionally councils have been very risk averse. New Energy suggests that further thought is put into the Plan or the next steps of a procurement process to see how risk can be more evenly shared between the City and project developers</p>	<p>Comments noted, and may be considered during Implementation.</p>	<p>No change.</p>

From	Issue	City Response-Action	Recommended change to the draft
	<p>viii. New Energy recommends a staged approach with modular gasification technologies so that the concept can be demonstrated initially at a smaller scale.</p>	<p>Comments noted, and may be considered during Implementation.</p> <p>Chapter 4 of the Master Plan notes that a staged introduction of the combined gas generation and methanation for natural gas quality aspects of the Master Plan may provide greater surety that all components are correctly integrated.</p>	<p>No change</p>
	<p>ix. It is New Energy’s experience that a commercial viable “cleaned” syngas from waste is not currently in operation despite the fact that some technologies are in demonstration stage.</p>	<p>Comments noted, and may be considered during Implementation.</p> <p>The City has noted in the Master Plan that energy recovery using gasification allows for multiple options along a staged process to its optimal long-term waste solution. A procurement process will identify in detail the capacity of the market to deliver a syngas of suitable quality for conversion to substitute natural gas. The case studies in the Master Plan identify a number of commercial technologies capable of providing syngas to that quality.</p>	<p>No change.</p>
	<p>x. The recently released NSW EfW policy in its current form places some hurdles for the volumes of waste that could be available from the City’s residual household waste stream. The policy settings around the resource recovery criteria ought to be more clearly explained as a hindrance to the City’s plans in its current form.</p>	<p>Comments noted, and may be considered during Implementation.</p> <p>The selection of a particular technology would be the result of a separate procurement approach should the Master Plan be endorsed. The EPA has not ruled out any of the reference technologies identified by the City. Some of the reference technologies have had facilities operating commercially for a period of 10 years.</p>	<p>New text added to section NSW ENERGY FROM WASTE POLICY STATEMENT at p. 49.</p>

From	Issue	City Response-Action	Recommended change to the draft
xi.	<p>Although it is mentioned in the Plan [p. 36, 37], contaminated organic materials as a good source of renewable gas or energy should be highlighted. The production of low grade compost from the City's waste via the current waste composting processes that has limited market avenues is a poor outcome for the resources in the waste.</p>	<p>Comment noted.</p>	<p>No change.</p>
xii.	<p>On the Summary table of Thermal Conversion Scenarios, diversion for the low temp gasification has been stated at 85%. New Energy would like this table to be updated to reflect the higher diversion rates that New Energy will be achieving using its integrated MRF and gasification solution.</p>	<p>Comment noted.</p>	<p>New text added to FIGURE 42: THERMAL CONVERSION SCENARIOS at p. 44.</p>
xiii.	<p>In the AWT Master Plan an ash melting scenario has not been included for low temperature gasification. No obvious reason has been given for this exclusion. New Energy recommends that an ash melting options be provided for the low temperature gasification. In the case above 97% to 99% diversion from landfill could be achieved.</p>	<p>Comment noted. While the use of secondary ash melting components is noted for some gasification technologies, for comparative purposes only the scenarios were principally derived from the ability of some high temperature conversion technologies to reach ash melting temperatures within the primary reactor, and the differences in syngas quality for conversion to substitute natural gas.</p>	<p>New text added to section THERMAL CONVERSION SCENARIOS at p. 45.</p>

From	Issue	City Response-Action	Recommended change to the draft
xiv.	<p>New Energy recommend a number of changes to Figure 42: Thermal Conversion Scenarios to address the Entech technology profile. These include:</p> <ul style="list-style-type: none"> • Inclusion of Hazardous category as numerous Entech facilities process this waste stream • Increase sizing limit to 1000mm • Adjust moisture content limits • Adjust waste diversion • Adjust material reduction in reactor • Increase syngas yield • Increase energy recovery • Include metals as a by-product 	<p>Comments noted.</p> <p>The City has incorporated new available data in the representation of the Low Temperature Gasification scenario.</p>	<p>New text added to FIGURE 42: THERMAL CONVERSION SCENARIOS at p. 44; FIGURE 56: MSW DIVERSION OF WASTE FROM LANDFILL at p. 66; APPENDIX A: GASIFICATION TECHNOLOGIES REVIEW;</p>
xv.	<p>The representative cold gas efficiency values in Table 57 of the Appendix are based on a pyro-combustion technology. New Energy recommends some adjustments to account for the values of a fixed bed low temperature gasifier technology. This may alter the values included in the Master Plan and Appendix. These include a more equitable basis setting for calculating:</p> <ul style="list-style-type: none"> • Values for cold gas efficiency • Syngas yield • Gross energy yield (including auxiliary energy input) 	<p>Comment noted.</p> <p>Cold Gas Efficiency and Auxiliary Power Requirement figures derived by Talent with Energy and reported in the Gasification Technologies Review are used in the model to estimate yields based on detailed composition analysis of MSW and C&I specifically for the Sydney Metropolitan Area.</p>	<p>No change.</p>

From	Issue	City Response-Action	Recommended change to the draft
	<p>xvi. The emissions data included in Appendix Table 70: Emissions Performance survey are based on the commissioning stage for the nominated Entech facility. New Energy requests that an updated data set be used for the Appendix and to generate the graph at Figure 60 of the Master Plan.</p>	<p>Comment noted.</p>	<p>New text added to FIGURE 60: EVALUATION OF EMISSIONS FROM THERMAL CONVERSION TECHNOLOGIES at p. 69; APPENDIX A: GASIFICATION TECHNOLOGIES REVIEW, at Table 70.</p>
<p>14. NSW Environment Protection Authority</p>	<p>i. The use of non-recyclable waste that would otherwise end up in landfill as proposed in the Advanced Waste Treatment Master Plan is consistent with the EPA’s <i>NSW Energy from Waste Policy Statement</i>.</p>	<p>Comment noted.</p>	<p>No change.</p>
	<p>ii. The Policy requires that energy recovery facilities must use technologies that are proven, well understood and capable of handling expected variability and type of waste feedstock. This must be demonstrated through reference to fully operational plants using the same technologies and treating like waste streams.</p>	<p>Of the 16 reference technologies used for performance evaluation in the Master Plan, five technologies have “fully operational” facilities. The remainder are mature enough to be “proven” or “demonstrated” as defined in the Master Plan.</p> <p>The five fully operational technologies are represented in over 12 operating facilities internationally that meet the EPA criteria. Further more detailed information will be provided to the EPA during the implementation phase.</p>	<p>No change.</p>
	<p>iii. The NSW government is committed to facilitating increased recovery and reuse of wastes back into the productive economy. The City is encouraged to engage with the EPA to ensure its proposals meet the requirements of the energy from waste policy, and to take advantage of available funding opportunities.</p>	<p>Comments noted, and may be considered during Implementation.</p> <p>City staff will continue to meet with EPA senior staff to ensure compliance with NSW policy and strategic objectives.</p>	<p>No change.</p>

From	Issue	City Response-Action	Recommended change to the draft
15. The University of Sydney	<p>i. The University of Sydney welcomes the strategic approach taken by The City to address its resource recovery, waste management and carbon emissions challenges. The high ambition level set by the City is commendable.</p>	<p>Comment noted.</p>	<p>No change.</p>
	<p>ii. We note the preferred technology for treating waste is Gasification because it appears to provide the greatest reduction in waste to landfill. However, we understand that Gasification also requires considerably more energy input compared to alternatives which means a reduced carbon reduction benefit.</p>	<p>Comment noted.</p> <p>All values for energy output in the Master Plan are net values allowing for input of additional energy requirements. The greenhouse gas reduction benefits accrue not only from waste diversion resulting in avoided landfill emissions, but also the displacement of fossil fuel power demand by supply of largely renewable gas for energy consumption within the City.</p> <p>The Gasification Technology Review included all energy inputs within its Performance Review. Mass and energy balances (Tables 57 to 62 of the Appendix) indicate an output gas efficiency from 57% to 67%.</p>	<p>No change.</p>
	<p>iii. There are a number of risks which need to be addressed, including but not limited to:</p> <ul style="list-style-type: none"> • Acceptance of Syngas into the gas network; • Progressive environmental regulations that would apply to the technology and its by-products; • Cost-effectiveness compared to alternative advanced waste treatment facilities that have been successfully employed, particularly in Europe; • Uncertainty about the benefits of Renewable Energy Certificates; • Facility location and planning approval; and • Guaranteeing long-term supply of waste to the Advanced Waste Treatment facility. 	<p>Comments noted, and may be considered during Implementation.</p>	<p>No change.</p>