ERF Governance and Policy
Department of Industry, Science, Energy and Resources
GPO Box 2013
CANBERRA ACT 2601

Email: emissions-reduction@industry.gov.au

26 August 2021

Dear Sir/Madam

Re: ERF method development priorities for 2022

Thank you for the opportunity to put forward an application for a new Energy from Waste (EfW) Emissions Reduction Fund (ERF) method.

The Waste Management and Resource Recovery Association of Australia (WMRR) is the national peak body for all stakeholders in the essential waste and resource recovery (WARR) industry. We have more than 2,000 members across the nation, representing the depth and breadth of the sector within business organisations, the three (3) tiers of government, universities, and NGOs. Our members are involved in a range of important WARR activities within the Australian economy, including infrastructure investment and operations, collection, manufacturing of valuable products from resource recovery, energy recovery as well as community engagement and education.

WMRR is at the forefront of the ongoing evolution towards a whole-of-system WARR approach and the development of a circular economy, and we continue to strongly advocate for a systems-based approach to managing materials in Australia. This approach must be underpinned by the waste management hierarchy, recognising that a variety of treatment options are required to resolve the challenges posed by discarded materials, including EfW, which is a safe and proven technology used in many parts of the world to treat residual waste and generate electricity.

In Australia, many jurisdictions are turning their attention towards EfW, as evidenced by the development of policy frameworks to incorporate this technology in a suite of WARR management solutions. As noted below in **Annexure A: Summary of EfW projects proposed and under construction**, there are a number of projects in the pipeline that will make EfW a reality in Australia in the short- to medium-term. These projects represent upwards of $4.5 billion worth of capital expenditure that industry and the federal government (through grant funding) will make towards the economy.

Reasons to develop an EfW method
Many of these EfW projects are currently in the key phase of development with some further along the approvals path and a couple closer to commissioning, though a significant number must address significant investment hurdles in order to proceed. In WMRR's opinion, an EfW method will have the ability to drive several positive outcomes for these proponents while meeting the objectives of the ERF, including:

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- **Displacing emissions intensive energy sources with a reliable, low carbon alternative:** the current ERF methods do not recognise the displacement of higher emissions intensity energy by the generation of energy through EfW projects as a form of abatement. An EfW method would enable emissions abatement from new and additional generation activities though pathways such as energy derived from organic waste fractions as well as energy derived from non-organic waste fractions.

- **Achieving viability:** EfW is a capital-intensive technology and as noted above, project proponents need to overcome significant investment hurdles. EfW plays an important and complementary role in an integrated WARR system; without EfW, residual waste will end up in landfill, which is a lower order solution than EfW. EfW technology can use residual materials to generate useful energy in the form of electricity, heat, fuel, and other useful by-products and in doing so, captures and uses energy from products otherwise destined for landfill – where decomposing materials produce methane for decades, adding to Australia's carbon footprint. Methane is 28 times as potent as CO2 over a 100-year period and as much as 86 times over the next 20-year period. Meaningful urgent action on climate change should prioritise methane reduction activities as they have the most immediate effect.

- **Reducing the WARR sector's emissions.** Australia disposed of 27 million tonnes in 2017-18 to landfills, which along with biological emissions and incineration, emitted more than nine (9) million tonnes of CO2 equivalent in 2017-18. WMRR acknowledges that the current landfill gas methodology has played a significant role in the capture and combustion of landfill gas and this method will continue to play an important role. Looking ahead, as Australia has a desire to increase its landfill diversion rate (we have a national target of 80% diversion by 2030), the development of an EfW method is the ideal next step to assist proponents with overcoming the investment hurdle by providing a revenue source, which will also serve as a strong incentive for proponents to find solutions to abate greater emissions (more below).

- **Maximising carbon outcomes:** an ERF methodology will level the playing field for various options for waste disposal/recovery/treatment, allowing those with the best carbon outcome to be advantaged (whether this is a new landfill with extensive gas capture or an EfW option).

- **Low risk of over crediting:** as EfW is capital intensive, it will not compete with composting or recycling; residual materials that go to an EfW facilities are those that would have otherwise been disposed of to landfill.

- **Minimising project emissions:** as the energy used by EfW facilities could be significant, an ERF method will encourage proponents to minimise project emissions, including through internal conservation of project generated energy by using this energy to power the facility or through the use of best practice heat recovery processes to minimise reliance on grid-derived energy.

- **The groundwork has been laid:** the department had previously considered an EfW method, with extensive work completed on the issues and opportunities for such a method, as well the activities that could be credited, how to ensure additionality and conservativeness, and a proposed approach to calculating abatement. The department also determined at the time that an EfW method could be largely based on existing methods such as the AWT method. The department's draft paper can be found at **Annexure B: Waste to thermal energy scoping**

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paper. As this work has already commenced, and is arguably close to finalisation, there is a compelling case to finish this method in order to drive greater carbon abatement across EfW projects that will soon come online.

It is for the reasons above that WMRR considers the completion of the EfW ERF method to be prudent, achievable, and desirable. Please do not hesitate to contact the undersign if you would like to discuss WMRR's submission.

Yours sincerely

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ANNEXURE A: SUMMARY OF EFW PROJECTS PROPOSED AND UNDER CONSTRUCTION

Project proponents	Location	Approvals progress/ project status	Technology/process	Residual waste input (tonnes/annum)	Energy product (per annum)	Cost
UNDER CONSTRUCTION						
Avertas Energy	Kwinana (WA)	Under construction; $23M ARENA funding secured	Combustion	400,000	36MW	$696M
East Rockingham WTE	East Rockingham (WA)	Under construction; $18M ARENA funding secured	Combustion	300,000	29MW	$511M
PROPOSED						
Malaysian Resources Corporation Berhard City of Ballarat	Ballarat (VIC)	Investigation/scoping on hold	Unknown	400,000	Unknown	$300M
Enrgx	Craigieburn (VIC)	Council planning permit application underway	Combustion	500,000	Unknown	Unknown
Great Southern Waste Technologies	Dandenong South (VIC)	EPA works approval process currently on hold; council planning permit application underway	Gasification	100,000 ± 10%	~7.9MW to the grid	Unknown

Project proponents	Location	Approvals progress/ project status	Technology/process	Residual waste input (tonnes/annum)	Energy product (per annum)	Cost
Recovered Energy Australia	Laverton North (VIC)	EPA works approval granted; council planning permit secured	Gasification	200,000 ± 20%	~15MW to the grid	$100M
Maddingley Brown Coal IntelliGas Calleja Group	Maddingley (VIC)	Investigation/scoping stage; $500,000 Sustainability Victoria grant secured.	Combustion	100,000	~10MW to the grid	$30M
Australian Paper SUEZ Masdar Tribe Australia	Maryvale (VIC)	EPA works approval granted	Combustion	650,000 ± 10%	~225MW to power the paper mill; excess to grid	$600M
Cleanaway Macquarie Capital	Eastern Creek (NSW)	EIS exhibition completed; SEARS issued	Combustion	500,000	55MW	$500M
EnergyAustralia Re.Group	Mount Piper (NSW)	Response to EIS submissions completed.	RDF	200,000-250,000	1400MW	$170M
The Next Generation	Eastern Creek (NSW)	Planning application refused by IPC, challenge currently before Land & Environment Court	Combustion	Amended from 552,500 to 300,000	31.9MW	$700M (based on original throughput)

Project proponents	Location	Approvals progress/ project status	Technology/process	Residual waste input (tonnes/annum)	Energy product (per annum)	Cost
Opal SUEZ	Botany (NSW)	SEARS issued	Combustion	500,000	1.5-1.8 petajoules of steam 64,000MWh	$250M
Greenfields Resource Recovery	Wallacia (NSW)	EIS submitted for Stage 1 (no EfW); a future Stage 2, not included in this DA, could involve implementing a gasifier to convert waste to energy.	Gasifier	95,000	Proposed scale 1MW	Unknown
Remondis	Ipswich (QLD)	Draft terms of reference for EIS being prepared	Combustion	500,000	50MW	$400M

ANNEXURE B: WASTE TO THERMAL ENERGY SCOPING PAPER

Agenda Paper 4

Thermal Waste Treatment Method Scoping Paper

Purpose

This paper sets out a proposed method for Thermal Waste Treatment projects under the Emissions Reduction Fund (ERF). The paper has been prepared by the Department of the Environment (the Department) for consideration by the Technical Working Group. It does not represent final government policy.

Background

The ERF recognises avoiding emissions from waste deposited in landfill under the *Landfill Gas* method[1]. The *Alternative Waste Treatment*[2] method provides for crediting emissions reductions achieved by diverting mixed solid waste away from landfill to AWT facilities, where the organic component can be aerobically treated and converted into compost. This treatment results in lower emissions of methane from the organic waste. A second method crediting the avoidance of organic waste deposited to landfill, the *Source Separated Organic Waste* method[3] is currently under development.

However, these waste avoidance methods do not recognise the displacement of higher emission intensity energy by the generation of energy by the projects as a form of abatement.

Proposed method and eligible activities

The proposed Thermal Waste Treatment method would be technology neutral, allowing a broad range of activities to be undertaken to convert waste into energy by combustion, pyrolysis or gasification processes.

Projects could implement a range of technologies to treat the waste and utilise the energy released to generate electricity. The method will generate credits from these two abatement sources, the avoidance of organic waste going to landfill, and use of waste arising to generate electricity, heat or steam.

The method would be largely based on existing ERF methods: the AWT method for the approach to crediting avoided organic waste to landfill; and the Coal Mine Waste Gas method for the approach to calculating the displacement of more emission intensive electricity from the grid. It is intended that drawing from the approaches in existing endorsed methods will streamline development and deliver a method in the shortest time.

As with other ERF methods, the method would allow both for new projects and expansion of existing activities above a baseline accounting for the pre-existing activity.

Proposed approach to calculating abatement

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[1] *Carbon Credits (Carbon Farming Initiative – Landfill Gas) Methodology Determination 2015*, available at: https://www.comlaw.gov.au/Details/F2015L00059

[2] *Carbon Credits (Carbon Farming Initiative – Alternative Waste Treatment) Methodology Determination 2015*, available at: https://comlaw.gov.au/Details/F2015L00060

[3] Exposure draft in available at http://www.environment.gov.au/climate-change/emissions-reduction-fund/methods/source-separated-organic-waste

Abatement is generated from two abatement sources, the avoidance of organic waste going to landfill, and use of waste arising to generate electricity, heat or steam. Existing methods serve as a guide for how project emissions could be calculated. These are discussed in detail below.

Activities to be credited

Avoidance of emissions from waste in landfill

Emissions abatement from new and additional waste treatment activities would be calculated from documented evidence of the amount of solid waste diverted from landfill. Solid waste mix types eligible for crediting could include any waste mix type containing organic material which would otherwise decompose in landfill to produce methane, and for which it can be shown that the fate of the waste in the absence of the project would have been disposal in landfill.

To calculate waste emissions, the method would set out rules for establishing which waste would be eligible for consideration. The organic components of this eligible waste could then be determined (e.g. using default values or an audit approach). From this organic component, methane emissions would be determined using appropriate methane conversion factors. The total methane generation potential would be credited as CO_2 equivalents.

Note that only the organic component of the waste stream is considered when determining the amount of abatement. If the waste stream consists primarily of non-organics such as plastics the thermal treatment of these waste types is unlikely to generate significant abatement under this part of the method.

Displacing more emissions intensive energy sources

For electricity generation, emissions abatement from new and additional generation activities could be determined via two main pathways.

1) Energy derived from organic waste fraction

The proportion of energy generated by the organic fraction of the waste stream could be eligible for crediting under the method, or may be eligible under the Renewable Energy Target (RET). It is important to note that claiming abatement under both the RET and the ERF is not permitted[4]. As such the project would need to decide whether it would include the organic derived energy fraction in the project's abatement calculation for ERF crediting or claim the fraction through the RET mechanism. The interaction between the RET and ERF is discussed further below.

2) Energy derived from the non-organic waste fraction

Energy generated from the non-organic fraction could be eligible for crediting if the emissions intensity of energy produced is lower than the input grid the energy is being provided to. Eligible electricity production could be calculated as the positive difference between the grid emissions factor[5] and a facility-specific energy emissions factor. Calculations to determine the value of this 'facility emissions factor' for a project would be specified in the method.

In the case of energy generation other than electricity, the method may also be able to provide for crediting heat and steam generated by a waste to energy project, to the extent that the project displaces the use of non-renewable energy to produce equivalent heat or steam.

[4] See Section 15A of the *Carbon Credits (Carbon Farming Initiative) Act 2011*.
[5] See Table 5(b) of the December 2014 version of the National Greenhouse Accounts Factors.

Project emissions to be deducted from abatement calculation

The energy used by a thermal waste to energy facility could be significant, and needs to be accounted for in abatement calculations. It is anticipated that proponents would minimise project emissions through internal conservation of project generated energy such as using energy generated from waste to power the facility, and using best practice heat-recovery processes within the facility to minimise the reliance on grid derived energy. Some projects may use the roof area of the facility to generate solar power.

In determining project emissions, it is necessary to measure and record material emissions which would not have occurred in the absence of the project from the following sources:

- Emissions arising from combustion of waste as a fuel source;
- Emissions arising from end-disposal of residual materials;
- Emissions from transport of the waste to the waste to energy facility; and
- Any other significant emissions sources.

Further requirements to ensure additionality and conservativeness

There are a number of initiatives already in place at state and territory government level to promote the uptake of waste to energy activities. There are strong incentives to pursue waste to energy, such as avoiding waste going to landfill, promoting better landfill management, identifying new sources of revenue, and diversifying energy sources.

As such, specific factors in the method that affect the level of abatement achieved would be updated over time to reflect changes in the waste sector's overall level of emissions. For example, the level of abatement from the treatment of the organic waste stream would be capped by the proportion of waste diversion from landfill already occurring. Treating waste that would not have gone to landfill would not generate additional abatement. Similarly the level of gas capture already occurring in relevant landfills that the waste is being diverted from or the state or territory level of landfill gas capture, whichever is greater must also be considered as this also represents the proportion of emissions reduction from waste that is not additional. This approach would be consistent with that used in other waste avoidance methods.

A further means to ensure additionality would be to apply a discount to projects which commence at a later date, to account for the expected increased take-up of waste to energy opportunities due to factors other than the ERF such as state or territory government policy. This could take the form of an annual discount rate applied to the abatement generated for each year after the method is made that a project is registered. It is also proposed that the method include a sunset provision of seven years, so that no projects could be registered after this date unless there were evidence that thermal waste to energy projects still required additional incentives from the ERF.

The level of abatement from energy supplied by the project to the grid would also be affected by the decreasing emissions intensity of grid energy over time as the RET and other policy mechanisms take effect.

The method will also need to consider the interaction with the Renewable Energy Target. There are a number of eligible renewable energy sources under the RET including wood waste, agricultural waste, food waste, food processing waste and biomass-based components of municipal solid waste which may also fall in scope of a Thermal Waste Treatment project supplying energy to the grid.

Projects will need to consider the merits of being recognised for RET certificates versus ERF credits and will be required to make an explicit choice to decide which scheme best suits their specific circumstances.