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INQUIRY INTO 'ENERGY FROM WASTE' TECHNOLOGY

Organisation: HZI Australia

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Hitachi Zosen INOVA

NSW Parliamentary Inquiry
Portfolio Committee No. 6 – Planning and Environment

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Subject: Submission to the NSW Parliamentary Inquiry into EfW Technology

Dear Parliamentary Committee,

Hitachi Zosen Inova Australia Pty Ltd (HZIA) is a fully owned subsidiary of Hitachi Zosen Inova AG, Zurich, Switzerland (HZI). HZI is the world leader in the supply of biological and thermal Energy from Waste (EfW) solutions:

- Biogas, compost and fertiliser from organics (food & green waste) with HZI Kompogas® Dry Anaerobic Digestion with more than 80 plants delivered worldwide
- Process steam, electricity, district heating & cooling, aggregates and metals with HZI grate based technology with more than 500 references worldwide
- Underlying proprietary technology resulting in safe, reliable, and energy-efficient solutions
- World-leading turn-key EPC provider of EfW plants inclusive operations & maintenance

HZIA declares its interest as the chosen technology supplier to Dial A Dump Industries (DADI) and the TNG Eastern Creek EfW project.

The following comments are based on our experience worldwide and reflect our commitment to provide sustainable waste recovery solutions.

a. The current provision of waste disposal and recycling, the impact of waste levies and the capacity (considering issues of location, scale, technology and environmental health) to address the ongoing disposal needs for commercial, industrial, household and hazardous waste

Waste arising in NSW is equivalent to similar economies which is logical as ultimately all goods we purchase have a limited use period which can range from single use to decades. It will grow further with population growth and prosperity.

Sustainable waste treatment is driven by regulatory instruments (most of the Europe and Japan requiring treatment of all waste to a defined standard before going to landfill) or financial instruments such as the NSW landfill levy (similar in Great Britain). Further

instruments define standards for treatment by recycling, composting, energy from waste and operations and final closure of landfills. They all aim to protect the environment.

The NSW waste levy has since its introduction increased recycling, composting and the production of engineered fuel.

Today, the revenue raised by the landfill levy is partly recycled and used to encourage the development of new infrastructure. HZIA advocates that all monies raised through waste levies should be fully reinvested in the waste and resource recovery sector to build resource recovery capacity and thereby reduce reliance on landfill disposal.

In its natural conclusion, the future levy receipts will one day go to near-zero as the amount of waste going to landfill will be near-zero. This also means that we have achieved a nearly fully sustainable society. It should be noted that 100% recycling is not achieve due to the natural laws, e.g. entropy or the principle that disorder increases over time. Also, agriculture, mining, energy production and manufacturing will always produce some amount of waste. Scientific advancement and technology help us to minimise wastage, but the laws of nature will never let us achieve 100% zero waste.

The waste levy has its limits as it isn't uniform over NSW or today at zero in Queensland. This perverts the underlying levy concept of driving waste away from landfill. An estimated half to a million tons of waste is transported annually to Queensland. A smaller amount is moved from Victoria to landfills in Southern NSW due to the absence of the levy in that area.

This interstate waste transport undermines the NSW waste sector. HZIA proposes that NSW discusses with all other States and Territories to harmonise the levy Australia wide to provide strong market based instruments to encourage investment in resource recovery. This harmonised levy should be set at the NSW level or even higher, e.g. similar to the £80/t as in Great Britain. This will drive waste out of landfills to further composting, recycling and Energy from Waste down as demonstrated by countries such as Austria, Belgium, Denmark, Norway, Sweden, and Switzerland which dispose less than 2% by weight of municipal solid waste (MSW) directly to landfill (source: Eurostat).

HZIA supports the 'waste hierarchy' with preference for avoiding the creation of waste as the most desired outcome, and disposal the least desired outcome. This hierarchy is nationally and internally accepted and sets priorities for the efficient use of resources and the protection of the environment. There are technical limits for the cost-efficient recycling through composting and recycling. NSW has nearly reached those limits compared with countries with near zero waste to landfill. Thus it becomes preferable to use Energy from waste to recover the energy and recycle detoxified metals and aggregates from residual waste rather than landfilling of this material. HZIA confirms Energy from Waste should only be used with Best Available Technology (BAT) to safeguard human health and the environment.

b. The role of 'energy from waste' to address the ongoing needs and the resulting impact on the future of the recycling industry

EfW is part of options in the waste hierarchy. HZIA supports the higher order use of composting and recycling. Nonetheless, not all waste can be cost-efficiently re-sued and then ends up in landfill. The superior option to landfill disposal is Energy from Waste as stipulated by the waste hierarchy,

Thermal EfW requires considerable market gate-fees as summarised for Great Britain by WRAP[1]:

- $130/t for lower range in large plants 400,000 tpy to 600,000 tpy
- $198/t for medium range in medium plants 200,000 tpy to 300,000 tpy
- $264/t for higher range in small plants 50,000 tpy to 100'000 tpy

The following conclusions can be drawn from this in the NSW context:

- Even at large scale EfW plants, there is therefore no impact on recycling (as it is less costly)
- Medium scale plants are barely competitive in NSW at today's landfill pricing and levy.
- Small scale plants would only make sense in the non-metropolitan areas which have an even lower landfill levy and therefore won't get build

Overall, it can be said that EfW isn't endangering recycling as also shown by the leading European countries which have high composting and recycling rates as well as EfW with only treated and low amounts of residues going to landfill.

The bigger dangers to recycling in NSW are:

- Lack of cost-efficient glass recycling capacity resulting in glass mountains or glass ending up as road base, which is down-cycling and not recycling
- Recycling of plastics is mostly down-cycling; washing and final sorting of plastics and its re-use typically happens in South East Asia in jurisdictions with lesser environmental controls, unknown end-to-end recycling rates, poor quality control and uncontrolled re-use in goods which are used in those countries as well as re-imported in Australia.
- Endangered or lack of metal recycling capacity in Australia and again similar issues as with plastics

The principles of sustainability include that problems should be solved in our geography and not delayed for resolution by future generations. Thus, we can only suggest a discussion for the establishment and drivers of a local recycling capacity. Landfilling of untreated waste has no social justice as the landfill gas and leachate problems will be with future generations for hundreds of years.

Today, the NSW EfW Policy imposes recovery hurdles which will require councils to introduce an organic bin for food & green waste in order to use the residual waste directly for EfW. As a provider of Anaerobic Digestion solutions we obviously welcome this. However, in particular in high density residential areas, the quality of the source separated recycling streams suffers. It is also know from the few local food & green organics collections that the quality is inferior compared with green waste collection alone. This phenomenon is also well-known overseas and the resulting compost is typically of lower quality however still better than the compost from mixed waste compost.

Above logic has been recognised already years ago for example by the Green Party of Germany and was summarised as follows already in 11 Oct 2011 – see slides 25 and 26 in Attachment ESWET Workshop Weltzin 1.10.2011, http://www.eswet.eu/tl_files/eswet/4.%20Events/2010.10.11_Workshop/ESWET_Workshop_Weltzin_11.10.2010.pdf):

"Lessons learned in Germany

- Avoiding waste and recycling quotas cannot be sufficient to solve all problems related to municipal waste – they are an integral part of the solution.

[1] WRAP: Gate Fees Report 2015, www.wrap.org.uk/gatefees, FX rate used 2 AUD equals 1 £

- Recycling has limits, e.g. plastic, hygienic products like diapers, and others…!
- Even recycling products become waste after use, problem of “down-cycling”.
- Using the best available technology for the incineration of residual waste leads to less impact on the environment and Environmental commitment is an important requirement for developing cleaner incineration technologies.

There are still challenges to face
A sustainable waste management is a central element of environmental and climate protection. This includes
1. establishing re-use and take back systems;
2. closing the cycle for raw materials, including integrated product-design and increased recycling;
3. no more landfilling at the earliest possible point;
4. residues should generate heat and electricity – using the best available and reliable technology.”

Similar, we note the pragmatic approach by Green Peace in Germany which supports Energy from Waste (see https://www.greenpeace-magazin.de/der-muell-und-die-mythen and in particular page 4):

“WIE SAUBER SIND MÜLLVERBRENNUNGSANLAGEN?“ or translated „HOW CLEAN ARE MSW ENERGY INCINERATION PLANTS?”

“They were the hate object of the 1980s, in almost every major city protested citizens’ initiatives against the construction of a waste incineration plant (MVA). People were afraid of dioxin pollution and noise by means of delivery traffic. Most of the horror scenarios have not occurred - also thanks to the civil protests. Although the number of waste incineration plants has almost doubled in the last 20 years, In 2007 there were 72 MVA. At the same time, however, the dioxin pollution has fallen to one thousandth compared to 1990 due to the strict pollution control regulation. "Fireplaces and tiled stoves are much bigger dioxin slugs than all waste incineration plants," says IFEU expert Giegrich. An IFEU study concludes that the plants "remove" air toxins: if the equivalent amount of electricity and heat were generated in conventional coal-fired power plants, an additional three tons of arsenic, cadmium and other heavy metals burdened the atmosphere. MVA is also better off in its carbon dioxide balance than its reputation: when one tonne of residual waste is burnt, about one tonne of carbon dioxide is produced. However, about half of this is classified as climate-neutral because the greenhouse gas originates from organic residues in the residual waste toner. As with every incineration, however, residues remain in the refuse bins - per ton of residual waste 250 kilograms of slag and 30 kilograms of filter dust from flue gas cleaning. The dusts must be placed in the special dumping site, while the slags, when they meet certain pollutant limits, are used in road construction.”

Greenpeace Switzerland and WWF Switzerland – amongst others - consider Energy from Waste as a cornerstone of a sustainable society which should achieve an electricity consumption of 2000 Watt per person (see also overview: https://en.wikipedia.org/wiki/2000-watt_society as shown in the publication for Energy perspectives 2035 of the Swiss Federal Office of Energy
http://www.bfe.admin.ch/themen/00526/00538/index.html?lang=en&dossier_id=00969

The only concern raised related to Energy from Waste is to increase the energy efficiency of the existing plant by getting more heat into district heating.

c. current regulatory standards, guidelines and policy statements oversighting 'energy from waste' technology, including reference to regulations covering:

i. the European Union

ii. United States of America

iii. international best practice

HZI Australia fully supports the statements and recommendations made in the WMAA submission. In particular, we emphasize the following positions and recommendations:

- A resource recovery threshold is introduced for landfills. The current NSW EfW Policy has established resource recovery hurdles for the use of waste in EfW, but without limits for landfills in its regulatory framework. This means that the recognised higher order use of waste faces more hurdles than landfilling. By logic of the waste hierarchy, this should be overcome by either stricter hurdles for landfilling or the introduction of landfill bans for all non-treated waste or waste with biological potential and any plastics.
- The resource recovery hurdle be removed for commercial and industrial waste collections which practice source separation. Alternatively, the perverse outcome can be that recovery at the source will be abandoned in order to achieve the required recovery hurdles in a separate recycling operation before going to Energy from Waste.
- Residual MSW should be allowed to go to Energy from Waste in the presence of a recycling bin and a green bin. The food waste bin should be at the discretion of Councils.
- The NSW EPA closely follows European best practice and incorporates future developments as they arise into the NSW EfW Policy.
- All new plants must fulfil the so-called R1-Regulation which sets a minimum thermal efficiency for classification as an energy recovery process. The R1-factor must include a correction factor for ambient temperature to adjust for the typically higher ambient Australian temperatures.
- The specific limit in the NSW EfW policy for chlorine is removed. The IED (Europe standard) applies the 1% rule only for hazardous wastes containing chlorine as these wastes can be more difficult to combust fully and therefore the required temperature will be 1100□C. The EfW Policy clearly states that the thermal treatment of hazardous wastes is excluded from the Policy statement.However the NSW EfW policy applies this rule to all waste containing chlorine. It has been industrially proven that waste can be combusted safely with elevated chlorine content and the flue gas be treated as required below the required emission limits.
- The Standard rules SR2012 No13 of the Environmental Permitting (England & Wales) Regulations 2010 to licence Treatment of Incinerator Bottom Ash (IBA) are adopted in NSW. Today, the re-use of bottom ash is not possible in NSW due to the lack of a Resource Recovery Exemption.

d. "additional factors which need to be taken into account within regulatory and other processes for approval and operation of 'energy from waste' plants"

The current NSW regulations and processes for approval and operation are comprehensive covering all aspects relating to the waste to energy facility. This includes emission control and residual emissions, health impact, social license, transport, recycling, greenhouse benefits.

e. "the responsibility given to state and local government authorities in the environmental monitoring of 'energy from waste' facilities"

HZIA supports the direct monitoring of the environmental performance of EfW facilities by EPA. The data should also be available to local council if so requested. Each operator should also submit public high level monthly reports about its performance.

f. opportunities to incorporate future advances in technology into any operating 'energy from waste' facility

Modern EfW facilities and technology providers are faced with competitive and regulatory pressures to continually improve performance of key components and the overall efficiency of the plant.

The proposed EfW facility at Eastern Creek is similar to most modern EfW facilities is that it is to be constructed as a modular facility which readily enables the upgrade of any equipment item with newer technology (e.g. grate, turbine, air pollution control, ash recycling and treatment).

Modern EfW facilities are flexible in terms of feedstock properties such that, in the event of upstream changes to waste composition and recycling practices, either through further source segregation or though waste pre-treatment, the composition changes, the plant can still process the waste, thus not discouraging advances in recycling through the current choice of technology.

g. the risks of future monopolisation in markets for waste disposal and the potential to enable a 'circular economy' model for the waste disposal industry

HZI Australia fully supports the statements and recommendations made in the WMAA submission.

h. Any other related matter

We suggest to the Parliamentary Inquiry to visit Environmental Authorities in Europa's or to invite them to Sydney to learn about best practice in waste management, resource recovery and Energy from Waste. Such contacts preceded the change of heart by the Western Australian authorities from landfilling to Energy from Waste.

HZI Australia would be happy to facilitate such contacts to Environmental Authorities to Germany, Switzerland and United Kingdom as well as visits to State of the Art plants in Europe.

If requested, I would be pleased to provide further evidence or information to the inquiry.

Kind regards

Hitachi Zosen Inova Australia Pty Ltd

Dr. Marc Stammbach

Managing Director

Attachments:

- Energy from Waste references by Hitachi Zosen since 1 Jan 2000
- HZI High Efficient EfW plants in operation
- ESWET Workshop Weltzin 11.10.2010