NOTES ON THE CRS PROPOSAL TO INCINERATE WASTE IN THE ACT

The following notes have been compiled as far as possible on the basis of readily available information, with sources cited in square brackets. Gaps in available information may mean that this briefing note does not fully reflect all the facts of the situation.

Who is Capital Recycling Solutions (CRS)?: Capital Recycling Solutions (CRS) is a joint venture between Benedict Industries Pty Ltd and Access Trading Company Pty Ltd (Access Recycling) in partnership with ActewAGL [1, p. 3].

What is CRS proposing?: Establishment of a facility in Ipswich Street, Fyshwick, to sort and incinerate waste from the ACT and NSW. The facility will operate 24 hours a day, seven days a week and will be located 6km south-east of Civic but less than one km from residences in Symonston and Narrabundah [1, pp. 20-21, 25]. CRS will need to import waste to ensure sufficient feedstock for viable commercial production of baseload electricity [1, p. 11]. Waste material is to be sorted into recyclable streams, with the remaining waste converted into electricity through thermal combustion. The proposal differs from the recent FOY Group proposal because CRS plans to convert waste into electrical power, while FOY's proposal was to produce diesel and LPG fuels [2] as outputs from plastic.

What is ACT Government policy on incineration?: The ACT Government requires CRS to complete an Environment Impact Statement [2]. However, the ACT does not appear to specify policies and technical criteria related to emissions and thermal efficiency to the same extent as the NSW Government [3]. This situation may encourage "jurisdiction shopping" by proponents of various waste management strategies as is already occurring with landfill in NSW [21], with the ACT becoming the ultimate dumping ground for NSW waste.

Are there comparable incinerators elsewhere?: Waste to energy incinerator facilities of varying type and purpose exist in countries such as the USA, Japan, Germany, Italy, etc [1, p. 9]. European incinerators have generally been designed to produce heat for heating industrial and residential premises. It is not clear what use CRS will make of low-level heat produced in its proposed facility. If unused, it may lead to a local heat island.

CRS [1, p. 10] states that '… countries with the highest recycling also have the highest use of incineration', seemingly implying that incineration will promote recycling. However, countries like Austria, Germany or Belgium, which have high rates of recycling, consequently have low levels of residual waste. They therefore need to import waste from other countries to ensure that incinerator plants remain commercially viable by operating at full capacity [19, p. 23]. In other words, incineration does not lead to higher levels of recycling; the direction of causation is the other way round.

As yet, there are no waste to energy incinerators in Australia, other than approval granted for a waste gasifier in Port Hedland WA [18]. A proposal by Urbis Pty Ltd to establish an incinerator plant in the Sydney suburb of Eastern Creek was opposed by the NSW

Environment Protection Authority [12] and the NSW Department of Health [13], primarily on air emission and health grounds.

Greenhouse emissions: No comprehensive data are available about the current composition of ACT waste to allow accurate estimates of greenhouse emissions that would be generated by the CRS incinerator. Nor are valid comparisons possible with the current emission of (partially captured) methane from existing ACT landfills, because methane is produced over a longer time period from legacy waste. Total ACT greenhouse gas emissions in 2015-16 were estimated [5, table 3] as 4,040 kilo tonnes $CO_{2\text{-}e}$, with total accumulated, not yearly, waste contributing 2.6 per cent.

Lack of data requires the assumption that the carbon content of ACT waste (e.g. organic material, textiles, plastics, etc) is comparable to the UK and other European countries at about 30 per cent [7]. The maximum Refuse Derived Fuel burned will be 270 kilo tonnes (kt) per annum, including imports of waste from outside the ACT [10], so that up to 297 kt of CO_2 would be emitted [11]. The current target for the ACT's $CO_{2\text{-}e}$ emissions for 2020 is 1918 kt [5, table 1], so that the CRS incinerator would increase currently anticipated emissions by about 15 per cent. Production of SO_x and NO_x during incineration would increase this amount, as would N_2O (nitrous oxide) if sewage is to be used as fuel.

Toxic emissions: CRS proposes to incinerate household waste (red top bins), industrial and building waste, and sewerage sludge. CRS proposes to recycle high value plastics (HDPE, PET and PVC), but intends to burn low density polyethylene (LDPE) and polystyrene [1, pp. 16, 37], with treatment of polypropylene unclear. CRS proposes to adopt European emission standards for a range of toxic emissions, including dioxins, furans, mercury, carbon monoxide, PM10 particulates (dust of a size that can be drawn into the lungs rather than being trapped in the nose, mouth or throat), and sulphur and nitrogen oxides. But CRS [1, p. 37, figure 8] does not provide any information on emissions of more dangerous PM2.5 particulates, for which there are no known safe levels, nor on nanoparticles.

CRS proposes continuous real-time monitoring of emissions data, 'just like European plants' [1, p. 37]. However, in contrast to other contaminants, it is technically not possible to measure dioxins continuously. Dutch waste incinerators are required to measure ambient dioxins twice a year [16] and German ones four times a year [17]: it is therefore not possible to guarantee that the daily emission of dioxins meets any specified health standard.

Further, it is the atmospheric and indoor concentration of harmful substances in residential areas and Fyshwick – rather than smoke stack emissions – that is critical. This is particularly important in areas of Canberra where pollution is accumulated and trapped by air temperature inversion conditions. The health effects of waste incineration can be extensive [20].

Preliminary emissions modelling of the CRS incinerator finds [1, pp. 37, 53] smoke stack emission concentrations will be below standards set in other countries. However, this is not the pertinent issue. The relevant question is the extent to which CRS' emissions will increase

existing ambient atmospheric concentrations of toxic compounds beyond acceptable community health standards. For example, NO_2 emissions at the Florey and Monash air quality monitoring stations in Canberra [8, p. 7] reveal highest recorded 1-hour peak concentrations in 2015 up to 0.03ppm (60mg/m^3) [9]. Comparable background peak concentrations in the vicinity of the incinerator (likely due to vehicle traffic in Fyshwick and on the Monaro Highway) could result in total NO_2 concentrations rising above acceptable levels.

Local ambient concentrations of toxic emissions could be reduced by building higher smoke stacks to eject them higher into the atmosphere, but this would simply disperse emissions farther across the ACT and NSW.

Toxic waste: Bottom ash (clinker) produced by incinerators is generally harmless, and can be used in road construction. But fly ash from flue gas cleaning [1, p. 46] typically contains materials like arsenic, various heavy metals, persistent organic pollutants, and carcinogens like crystalline silica. Transport and burial by CRS in the Mugga Lane landfill would require special precautions, but leaching into Jerrabomberra Creek and Lake Burley Griffin is ultimately possible. CRS estimates fly ash will be 3-4% (about 10,000 tonnes) of the mass of incinerated product, but provides no data on the volume that will be sent to landfill.

Overall ACT waste strategy: On 20 February 2017, the ACT Government sought proposals from industry on solutions for reducing waste going to landfill, with blocks set aside in Hume for this purpose [6]. Industry responses and a business case are to be considered by Government in late 2017 [6, p.9].

Detailed modelling in the USA indicates that a number of industrial activities generate air pollution damage greater than the economic value they add to the economy. Solid waste combustion and incineration has the highest ratio of costs to benefits, greater than petroleum-fired electric power generation and coal-fired electricity generation [14, table 2].

No social cost-benefit analysis appears to have been undertaken – or foreshadowed – by the ACT Government to compare the continued use of combined recycling plus landfill, increased intensity of recycling, or incineration of non-recycled waste. In particular, an incineration waste tax should be considered to ensure optimisation of the amount of material that is recycled rather than being incinerated indiscriminately [15, p. 37]. A detailed and rigorous social cost-benefit analysis should be undertaken by the ACT Government before the CRS – or any other – proposal is considered further.

Community consultation: Employed by CRS and ActewAGL, Newgate Communications ran four focus groups in the ACT with a total of 34 industry and resident participants from both sides of the lake. One of the four groups consisted of eight local residents in Kingston and Pialligo [1, p. 33] but none appear to have included residents of Griffith or Narrabundah.

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[10] https://capitalrecyclingsolutions.com.au/how/ . The CRS annual requirement would be 270 kilo tonnes of Refuse Derived Fuel, including 50 kt imported from outside the ACT.
[11] The mass of CO_2 is equal to the ratio of its molecular mass (44) relative to the molecular mass (12) of carbon, multiplied by the mass of carbon (270 x 0.3), so that 270 x 0.3 x (44/12) = 297 kilo tonnes of CO_2.
[12]
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