

# WASTE TO ENERGY: GREENWASH AT ITS BEST

The Victorian Government and the Environment Protection Authority (EPA) have given waste-to-energy incinerators the green light in Victoria, with minimal environmental or health safeguards. Thanks to industry lobbying and greenwash, many are convinced incinerators are the clean alternative to landfill, however the facts tell a different story. There are now four major proposals for waste incinerators in Victoria that would consume our entire municipal, and some suitable commercial waste streams, without any further organic or recyclable waste removed.

Incinerators threaten to stifle our shift to zero waste and a circular economy by locking councils into long-term contracts for waste generation, not reduction. Incinerators also generate significant amounts of hazardous waste, threaten people's health and produce climate pollution. Waste incineration is not a 'renewable' source of energy; it is an extractive industry that burns waste made from virgin resources, mostly crude oil. Without intervention now, incinerators threaten to lock us into the old waste paradigm and become a source of significant environmental problems into the future.

## KEY MISCONCEPTIONS ABOUT WASTE INCINERATORS

- Waste incinerators are a 'renewable' and clean source of energy
- New incinerators don't create toxic waste or health risks like older plants
- Waste incinerators are better for the environment than landfill

## THE FACTS ABOUT WASTE INCINERATORS

- Incinerators are more polluting than coal and gas-fired power stations for energy output and they are very expensive

- Even new plants generate tens of thousands of tonnes of hazardous waste every year, which risks the health of workers and local communities
- They also threaten to undermine our transition to a circular economy by locking local councils into long-term contracts with the same unsustainable linear model of resource extraction, single use and disposal that has failed us for decades
- The Victorian Government should phase out landfills, by introducing policies and investment in zero-waste solutions. In the short term the environmental harms of landfills can be significantly reduced if organic wastes, such as food scraps and garden waste, are removed from them

# WHAT ARE WASTE INCINERATORS?

Waste incinerators, sometimes called waste-to-energy facilities, burn waste at very high temperatures, turning it into gas and ash.<sup>1</sup> They are essentially a fossil fuel power station. The main accelerant for the combustion is high calorific value, fossil fuel-based plastics (supported by natural gas backup to reach operating temperature). Small amounts of energy can be produced as a by-product of this process, using the steam and turbines like other fossil fuel power stations. Some facilities also use the excess heat as an energy source.

Gasification heats waste in a low-oxygen environment, generating a synthetic gas called 'syngas' which is then combusted to generate heat to drive steam turbines.<sup>2</sup> A third technology called pyrolysis is also promoted. Similar to gasification, it is a two-stage incinerator, but the end product is primarily oil, as well as the gas and ash. All three processes are categorised as incineration by the EU and US Environmental Protection Authority (EPA).

Municipal mixed waste streams with plenty of plastics are the most flammable and most desirable waste stream for incinerator operators. Some commercial waste is suitable, depending on the feedstock. Organic waste actually causes problems for incinerators due to moisture content, which must be reduced by pre-heating waste – usually with gas-fired heating. Most household waste contains significant organic waste at the moment.

## INCINERATORS IN VICTORIA

**There are now four waste incinerator proposals in Victoria at various stages of development:**

- **Maryvale** – 520,000 tonnes municipal, 130,000 tonnes commercial waste capacity (most advanced proposal with EPA works approval). Cost: \$600 million. Australian Paper and SUEZ are the proponents. They propose to use all the waste from Eastern Victoria, the South-Eastern suburbs and other inner city areas.
- **Laverton North** – 200,000 tonnes. Recovered Energy Australia is a private business working with the council to develop this gasification project. Cost: \$100 million. This project is currently undergoing the community engagement phase.
- **Dandenong** – 400,000 tonnes. Consortium of South East councils developing the tender proposal with the support of the Municipal Waste and Resource Recovery Group.

- **Ballarat** – 400,000 tonnes. This Ballarat Council-led process has been put on hold in August due to the policy uncertainty in Victoria, but could be reignited at any time.
- **Hume** – 500,000 tonnes. Cost: \$450 million. Development proposal by private company Enrgx.

**Total volume = 2,150,000 tonnes**

In 2016–17, households generated 1.18 million tonnes of kerbside 'residual' waste.<sup>3</sup> It's estimated to be around the same in 2023 when most of these facilities are due to open. The proposals being developed would not only consume all our municipal waste, but a large volume of commercial waste, without any ambition to improve recycling or organic waste recovery in Victoria.

## THE PROBLEMS WITH INCINERATORS

### INCINERATION WILL UNDERMINE THE TRANSITION TO ZERO WASTE, A CIRCULAR ECONOMY AND OUR LOW-EMISSIONS FUTURE

Incinerators rely on a high volume of waste, perpetuating the linear model of resource extraction, single use and disposal. The Victorian Government's stated intention is to move Victoria towards a zero-waste, circular economy.

Pushing Victoria head first into a mass incinerator rollout is the opposite direction the rest of the world is heading. The European Union is starting to move away from waste-to-energy plants, recently advising member states to not provide clean energy subsidies for waste-to-energy generation.<sup>4</sup>

The Australian Paper Maryvale facility is proposing to lock local councils into 25-year contracts to deliver this waste stream to the incinerator. This prolonged timeframe would be a clear disincentive for councils to reduce waste levels and undermine efforts to increase recycling, composting, and reduce plastic use.

Sustainability Victoria's Statewide Waste and Resource Recovery Infrastructure Plan (SWRRIP) highlights waste incinerator projects will only be a viable option if there is a consistent supply of required feedstock.<sup>5</sup> It points out that some materials currently unable to be recovered from residual waste streams, such as plastics, may be able to be removed from the waste stream over the 30-year lifespan of the SWRRIP through investment in infrastructure such as sorting technologies.<sup>6</sup>

If local governments enter into contracts with waste incinerators, they may not be able to divert waste by

utilising these new technologies, as their first priority will be meeting their contractual obligations for required feedstock volumes for incinerators. In Madeira, Portugal an over-allocation of incineration capacity has had exactly that effect. The island state currently incinerates 89% of its waste, and despite this high rate of incineration, the facility is still operating nearly 30,000 tonnes below capacity. Only 10% of waste on the island is recycled, despite having a mandatory recycling target of 55% by 2025.<sup>7</sup> All organic waste recycling was discontinued on the island in order to bolster volumes of waste being sent to the incineration plant.

Councils face fines and court if they don't meet their required waste volume. In the United States, Wheelabrator, the owner of a waste incinerator plant in Baltimore is suing the Baltimore County Government, saying it reneged on a contractual agreement to send an annual minimum amount of trash to the facility. Wheelabrator is asking for damages 'to exceed \$32 million'.<sup>8</sup>

With only long-term, 25–30-year contracts on the table for waste incinerators, councils who don't want to lock in long-term waste generation have the option to sign contracts with low-volume commitments. This is at least a better way forward if they choose to go down the path of incineration.

## **INCINERATORS GENERATE LARGE VOLUMES OF GREENHOUSE GAS EMISSIONS – MORE THAN COAL OR OIL-FIRED POWER STATIONS**

Companies like Australian Paper promote the greenhouse benefits of incinerators over landfill, but never disclose the methodology for their calculations. Independent studies of the full waste management picture tell a very different story.

Organics in landfills generating methane are the primary source of climate pollution, not plastics. If organics are removed from kerbside waste through a state-wide food and garden organic collection and composting system, then emissions are significantly reduced. Organics can affordably and easily be removed from our waste stream. Diverting organics from the waste stream prevents landfill methane emissions and prevents leachate formation contaminating groundwater at the landfill site – effectively eliminating one of the main arguments that landfill is not a favourable waste management practice.

Several councils in Victoria have led the way on implementing this, in the absence of support and leadership from the Victorian Government.

Incinerators have been presented as a better alternative

to landfills. Landfills are environmentally problematic and we should move them outside the urban growth corridor and replace them over time with real solutions, like waste reduction and better recycling and composting, not another industry that will create a raft of new problems.

Comparing incinerator emissions to landfill emissions (to include organics, while not accounting for landfill gas extraction) is a straw-man argument designed to make incinerator technology appear environmentally friendly.

Plastics in landfill don't create greenhouse emissions; burning plastics does. Incinerators are essentially inefficient oil-fired power stations.

Incinerators can produce a higher level of CO<sub>2</sub> emissions per unit of electricity generated than oil or coal-fired power. In one US EPA study, electricity generated by incineration produced 1.36 tonnes of CO<sub>2</sub> per kWh, whereas coal-fired generation produced 1.02 tonnes per kWh.<sup>9</sup> A study conducted by UK researchers found that incinerating waste could emit up to two times as much CO<sub>2</sub> per kilowatt hour as a coal-fired power plant.<sup>10</sup>

Several studies have found that incinerators and landfills contribute much higher levels of greenhouse gas emissions throughout their lifecycle comparative to source reduction, reuse, composting, and recycling of the same materials.<sup>11, 12, 13</sup> One study found composting food waste produced just over 0.5kg of CO<sub>2</sub> per kg of waste whereas incineration produced four times as much (nearly 2kg of CO<sub>2</sub> per kg of waste).<sup>14</sup>

Waste incineration for energy capture is not a 'renewable' source of energy; it is an extractive industry that burns waste made from virgin resources (such as plastics, which are made from oil). It also creates a lot of climate pollution. Despite this, incinerators are currently called 'renewable energy' by the industry and eligible for greenhouse credits, which is used to prop up their expensive financial model.

The Australian Renewable Energy Agency has so far contributed \$58 million in total to 27 waste-to-energy and bioenergy projects in Australia. Energy generated by these facilities is also eligible for Large-Scale Generation Certificates as part of the Federal Government's Renewable Energy Targets.<sup>15</sup>

## **WASTE INCINERATORS ARE ENERGY INEFFICIENT AND EXPENSIVE**

Very little of the energy embedded in plastic products (from extraction, production, manufacturing and transport) is recovered by burning as waste-to-energy. Recycling products saves far more energy overall. Studies found that energy recaptured by recycling plastics was nearly 75 megajoules per kg of waste, while incineration

was a mere 6 megajoules per kg of waste.<sup>16</sup>

Waste incinerators are incredibly expensive investments that generate little energy. They create ten times less energy than a solar plant, for the same upfront investment. For example, a 64ha solar farm being established at Maffra is a \$50M project and will produce 30 megawatts of power.<sup>17</sup> This is exactly the same estimated electricity output that the nearby \$600M Australian Paper Maryvale incinerator will produce at over ten times the cost of the renewable facility.<sup>18</sup>

## WASTED OPPORTUNITIES

Waste-to-energy plants fail to create jobs. Research published by Environment Victoria in 2009 showed that incinerating 10,000 tonnes of waste would create only one job. Landfilling the same amount would create six jobs, and recycling would create 36 jobs.<sup>19</sup>

Australia is facing issues with soil erosion and the loss of productive fertile land. Using organic waste to produce compost (and digestate from anaerobic digestion) helps add nutrients back into topsoil and plants, enabling them to more effectively capture carbon. Destroying this valuable carbon capturing and nutrient-dense resource to generate small amounts of energy and large quantities of toxic ash makes no sense and is unsustainable.

## INCINERATORS GENERATE HAZARDOUS WASTE

Incinerator chimney stacks have filters in them in an attempt to reduce toxic emissions and particles entering into the atmosphere and the environment. The filters build up fly ash – or ‘filter cake’ – over time, which is a highly hazardous material that must be disposed of in a hazardous waste landfill. 1%–5% of the volume of the original waste feedstock becomes fly ash.<sup>20</sup> In Germany, the toxic fly ash from waste incineration is buried deep in disused salt mines as they know how dangerous it is. High volumes of chemicals and water are also used to treat the gas coming out of the furnaces.

Australia has been working for years under the Stockholm Convention to eradicate dioxins and furans in our environment.<sup>21</sup> These persistent organic pollutants (POPs) are known to be carcinogenic, mutagenic, teratogenic and have highly toxic characteristics.<sup>22</sup> Waste incinerators will create a new and large source of dioxins from emissions and ash. Incinerators are listed in Annex C of the convention as a primary source of these hazardous pollutants, which Australia has a legal obligation to reduce and eliminate – not increase.

The Lyndhurst landfill in Dandenong South is the only landfill accepting higher levels of hazardous waste

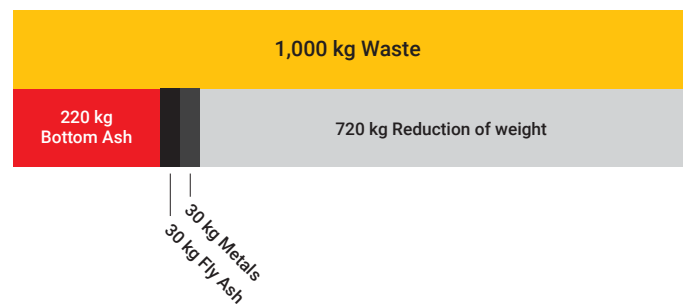
in Victoria. It is projected to reach capacity and be closed in the next few years – well before the proposed incinerators reach the end of their life, even without factoring in the increase in waste volumes the new incinerators will generate. This will mean Victoria will need to build new landfills that are capable of storing hazardous waste.<sup>23</sup> This is often incredibly controversial as no community wants, nor should they have to endure a hazardous waste landfill in their backyard.

Based on the predicted state waste incineration throughput of 1.65 million tonnes, Victoria will need to create capacity to store between 16,500 tonnes and 82,500 tonnes of highly toxic ash – every year. The lifespan of the average waste incinerator is around 30 years. Over 30 years, at the predicted waste throughput of 1.65M tonnes per annum, Victoria will need to create capacity for between 495,000 tonnes and 2.47 million tonnes of highly toxic fly ash.

## WASTE INCINERATORS GENERATE BOTTOM ASH, WHICH CONTAINS HAZARDOUS ELEMENTS THAT NEED TO BE DISPOSED OF IN LANDFILL IN HIGH VOLUMES<sup>24</sup>

After the incineration/gasification, between 25%–30%<sup>25</sup> of the original feedstock material (depending on the feedstock composition) remains in the form of ash. This also needs to be disposed of in landfill.

The figure below shows the industry-estimated standard distribution of each tonne of waste burned to bottom ash, metals and fly ash.



There is no market for ash by-product (for road base etc), despite industry claims. Victoria has an excess of ash due to our coal-fired power stations.

Analysis of kerbside rubbish collection reveals rubbish earmarked for burning contains plastics, electronic and other hazardous wastes such as batteries, light bulbs and asbestos. Australian Paper for example, says it will undertake a ‘visual assessment’ so only appropriate rubbish finds its way into the incinerator, but batteries containing mercury can be hidden inside a device and are not easy to see on a rapidly moving conveyor belt.



Brominated plastics from electronic equipment casings increase the development of brominated dioxins in the incinerator ash, and PVC plastics generate chlorinated dioxins. The reality is, these materials will get into the waste stream and the ash will be hazardous.

Despite this, it is unclear from Victorian EPA approvals whether facilities will be required to test the chemicals in the ash before disposing of it in landfill.

Based on the conservative 25% rate and the 1.65M tonnes per annum throughput proposed, Victoria will need to find disposal sites for 412,500 tonnes per annum of contaminated bottom ash. If brominated dioxins are listed in the Stockholm Convention, it is likely that bottom ash will need to be treated in the same way as fly ash (as highly hazardous waste). Over the 30 year life of the incinerators, Victoria will need to establish capacity for 12,375,000 tonnes of bottom ash.

## INCINERATORS COULD HAVE NEGATIVE IMPACTS ON PUBLIC HEALTH

Air pollutants such as nitrogen oxides, sulfur dioxides, particulate matter, mercury, lead, dioxins and furans are emitted from waste incinerators at higher levels than natural-gas-burning power plants. These substances are known to have effects such as increased risk of cancer, respiratory illness, cardiac disease, and developmental and neurological problems. In countries with many waste incinerators, such as the Netherlands, dioxins and other POPs are found in high levels in the environment, especially in hotspots where fly ash has been used in the environment.<sup>26</sup> Many health harms have been connected to incinerators. For example, a 2015 study conducted in Italy found that women living in close proximity were more likely than the general population to experience a miscarriage.<sup>27</sup>

Australia's air pollution standards for sulfur dioxide (SO<sub>2</sub>) for example, are currently 11 times higher than standards recommended by the World Health Organisation. Victoria's LaTrobe Valley brown-coal-fired power stations are high sulfur emitters, well above legal limits in China and the EU.<sup>28</sup> The current Australian Paper proposal for a waste incinerator in Maryvale in the LaTrobe Valley would add further SO<sub>2</sub> to the atmosphere, yet current public health risk assessments that have been conducted by Australian Paper have not considered the cumulative impacts of sulfur emissions in the valley.

## LABOR'S COMMITMENT

The *Victorian Branch Australian Labor Platform 2018* stated that Labor will 'ensure recyclable and compostable organic material are not burnt to provide a one-off energy

source',<sup>29</sup> yet the Australian Paper waste incinerator was not required to go through an Environmental Effects Statement process and has had no such requirement laid on it by the current Victorian Government – not even a requirement for a sorting facility to remove obvious recyclables before incineration.

## THERE IS NO WASTE IN NATURE – LEADING THE WAY FORWARD

We need a moratorium on waste incinerators until a thorough and considered community conversation can take place, free from the greenwash currently rife in the industry. We need the facts and an informed discussion. The Victorian Government must also ban recycling and organic waste from being burnt in incinerators. Councils should take a long-term approach to waste management when considering any contracts regarding waste incinerators and not overcommit on waste generation volumes.

We need to implement solutions that will begin our transition to zero waste and a circular economy. The most important thing we can do to achieve this is to reduce our waste generation.

The first step is to introduce kerbside food and garden waste collection for composting across the state for households and businesses. With around 40% of household waste composed of organic material, this would significantly reduce landfill volumes and the associated climate emissions.

The second step is to ban the use of unnecessary single-use plastics like straws, stirrers, take-away cutlery, cotton tips, balloon sticks, as well as polystyrene take-away containers and cups. We need packaging to be overhauled to ensure all packaging is truly reusable, recyclable or compostable, and excess packaging is eliminated.

To improve recycling rates we need to do a few things. Firstly, introduce a container refund scheme which inspires container litter to be collected and recycled. We also need to introduce kerbside bins statewide for separate glass collection, to reduce contamination in our recycling stream and allow for easier processing.

We should follow the lead of the European Union and set strong targets to ensure we continue to increase our recycling and composting levels, and reduce our waste generation over time.

Importantly, we need to invest in our local recycling industry, and the facilities to sort and process it into a

high-grade recyclable material. We can create a market for recyclable material through government procurement, appropriate targets for use of recycled materials in packaging, infrastructure and other measures.

These are just some of the changes that we need to make, but arguably the most important is to break free from plastic and waste, and achieve plastic-free seas, waterways and landscapes.

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