creating energy from waste

Air Quality

Understanding air quality

Air quality refers to the condition of the air we breathe. Its quality can be impacted by pollution, including smoke, dust, and other factors that can affect visibility and the environment.

The Environment Protection Authority (EPA) is responsible for monitoring and reporting air quality data and regulating air quality in Victoria.

The EPA uses an air quality index (AQI) summary to provide an overall air quality measurement at each location. In the Latrobe Valley, the EPA has monitoring stations in Morwell South, Morwell East, Traralgon, Moe and Churchill to provide regular information on local air quality and the concentration of pollutants in the air.

Overall, the Latrobe Valley's air quality is comparable to Geelong and metropolitan Melbourne. According to EPA monitoring, all air quality goals set by the national air quality standards (Ambient Air NEPM) were met. These goals allow for a small number of breaches of the daily standards for key measures, such as $PM_{2.5}$.[1]

Air quality and the potential Energy from Waste plant

An air quality impact assessment was undertaken as part of the feasibility study into the adoption of Energy from Waste (EfW) technology at Australian Paper's Maryvale Mill.

The assessment methodology used the EPA's approved regulatory air model for impact assessments - AERMOD, State Environment Protection Policy (Air Quality Management) SEPP (AQM) standards, and the European Union's Industrial Emissions Directive (IED) to assess potential emissions from the EfW plant.

Following these stringent requirements, the modelling found:

- the emissions to air from the proposed EfW plant are essentially minimal, with no adverse air quality impacts anticipated
- the existing Maryvale Mill buffer zone, which is approximately 3km around the mill, is considered satisfactory for the proposed EfW plant
- there is a low risk of air quality impact from the project's EfW emissions.

Emissions from the plant will meet all IED and SEPP (AQM) emission limits. The only exception to this is related to fine airborne particle ($PM_{2.5}$) levels. While the EfW modelling found a negligible contribution to existing $PM_{2.5}$ levels, the Latrobe Valley experiences, at certain periods throughout the year, pre-existing elevated background levels of $PM_{2.5}$. These elevated seasonal background levels are the result of smoke from planned burning programs and bush fires.

What is particulate matter?

Air quality is affected by particulate matter which refers to the different types of particles in the air we breathe. Particulate matter from natural sources include pollens, sea spray and bush fires, and some from human activity include motor vehicle emissions and wood heaters.

Particles can be classified on the basis of their size, referred to as their 'aerodynamic diameter'. 'Coarse particles' are those between 10 and 2.5 micrometres (µm) in diameter (PM_{10}); and 'fine particles' are smaller than 2.5 µm ($PM_{2.5}$).

For comparison, the diameter of a human hair is 70 µm and this is seven times the diameter of the largest 'coarse particles'.

1. Frequently asked questions about air quality in the Latrobe Valley Environmental Protection Authority Victoria (EPA 2016)

Emissions from EfW plants

Emission release, and the regulation and control of them, is a part of everyday life. Many of the substances investigated as part of the EfW study occur naturally (such as particulate matter, mercury, cadmium and other heavy metals), or are produced through various industrial processes such as electricity generation, concrete and plaster manufacture, mining and the daily operations of hospitals and intensive farming operations.

For example one of the contributors to emissions in our environment are passenger and transport vehicles. The table below shows the output of an average petrol engine motor vehicle, of which Australia had over 12 million in 2016.

Emission	Kg/kl of fuel
Carbon dioxide	2,305
Methane	17
Carbon Monoxide	6.7
Particulate matter (PM_{10})	0.067
Particulate matter ($PM_{2.5}$)	0.062
Sulphur Dioxide	0.098
Total volatile organic compounds	2.5
- Benzene	0.12
- 1,3 Butadiene	0.059

EfW is recognised as a proven and reliable technology which has been used in Europe, North America and Japan for decades. Like these overseas operations, the proposed EfW plant at Maryvale will be subject to the most stringent air quality and emissions regulations in the world.

EfW plants are not emission free. However, this regulation requires sophisticated technology which ensures there is no harmful impact on the environment or human health. Indeed, up to half of the project's $600 million investment will be spent on technology that captures and treats emissions before they leave the plant.

The table below highlights not only the European regulatory requirements on the release of identified emissions, but also the performance of actual EfW plants in outperforming these already stringent limits.

Emission	EU IED regulatory limits	Actual EfW plant outputs
Carbon Monoxide (CO)	50 mg/Nm³	10.2 mg/Nm³
Oxides of Nitrogen (NO_2)	200 mg/Nm³	179.8 mg/Nm³
Sulpher DiOxide (SO_2)	50 mg/Nm³	6.9 mg/Nm³
PM_{total} (Dust)	10 mg/Nm³ (daily) 30 mg/Nm³ (1/2 hr)	1.8 mg/Nm³
$PM_{2.5}$ (Dust smaller than 2.5µm)	N/A	0.2 mg/Nm³
Hydrogen Chloride (HCL)	10 mg/Nm³	5.5 mg/Nm³
Hydrogen Fluoride (HF)	1 mg/Nm³	0.018 mg/Nm³
Dioxins/Furans	0.1 ng/Nm³	0.023 ng/Nm³
Mercury (Hg)	0.05 mg/Nm³	0.0019 mg/Nm³
Cadmium (Cd)	0.05 mg/Nm³ as Cd & T1	0.0007 mg/Nm³