

CASE STUDY

Landfill gas capture and energy generation



Client		EPSA for Cleanaway
Project completion		2017
Location		Ravenshall Landfill Site, VIC

ABOUT

The Boral Western Landfill at Ravenshall / Deer Park plays a critical role in the waste management and resource recovery processes supporting metropolitan Melbourne.

The operation was established in 1999 within an exhausted void vacated by the Boral Deer Park Quarry following extraction completion. More than 500 000 tonnes of commercial and residential waste is taken from across nine municipal areas in Melbourne. The landfill site is managed by a workforce of up to 40 people.

The site also operates a landfill gas-to-energy plant, generating electricity from the gases (landfill gas) which result from decomposing waste. With continuous investment in the plant over the years, enough 'green' power for up to 12,000 homes is being produced.

An additional landfill area has been covered in response to the carbon price mechanism and the landfill gas generated from this area is to be captured and delivered to four new Caterpillar electricity generators, each capable of generating 1MW. The size of the landfill area is significant and the additional power generation capacity has been approved. Two new landfill gas delivery systems were required to condition the landfill gas before delivery to the additional generators.

THE SOLUTION

- › Two new landfill gas conditioning and delivery skids were engineered and manufactured by Energy360.
- › The new design also required re-engineering pipeline placements for standard equipment.

WHAT HAPPENS?

- › Using a PD (Positive Displacement) Blower, the landfill gas is extracted from the landfill gas wells at high pressure. The landfill gas enters the heat exchanger where the gas is cooled to reduce moisture content. The gas flows through a large knock out pot to drop any remaining water.
- › The PD blower regulates the gas flow, pressurizes the gas and delivers it at a constant temperature, moisture content and pressure to the Caterpillar generators.

WHAT DID ENERGY360 DO?

- › Designed and manufactured two new gas conditioning and delivery skids which could each handle 1,000m³ /hr of landfill gas
- › Each gas delivery and conditioning skid supplies two only, 1 MW Caterpillar engines
- › The extracted gas has a high water content and its methane composition varies. The engineered solution accounted for these variables.

THE RESULT

- › The new gas conditioning skids have been operating with maximum uptime since September 2017
- › Equipment is fit for purpose and the emissions outputs are accurately measured
- › Electricity is being reliably generated from landfill output, using landfill gas delivered via Energy360's equipment, contributing significantly to the circular economy

