



Lessons Learnt

Lessons Learnt Report: Solar Landfill Project – Wollert Landfill, Victoria

Project Name: Advancing Renewables Programme Funding Agreement Number: G00839: Pilot Landfill Solar Project

Knowledge Category:	Technical
Knowledge Type:	Construction
Technology Type:	Solar PV
State/Territory:	Victoria

Key learning

A key lesson learnt during the construction phase of the Pilot Landfill Solar Project was the potential explosive risk of landfill gas. As waste decomposes it creates landfill gas which is generally 60% methane and 40% carbon dioxide. This combination of gases creates an explosive risk. Hence, unlike regular solar installations on virgin land, landfills have explosive levels of gas which must be taken into consideration at all phases of development

The presence of landfill gas meant the entire system needed to meet strict safety standards. The trenches and conduits installed as part of the solar system have the potential to create gas pathways and gas build-up can occur in electrical equipment creating a dangerous explosive risk. During the installation of the solar system, it was identified that the electrical equipment needed to be redesigned as the standard equipment was not suitable for solar installations where there was an explosive risk.

A site meeting was called by our electrical engineers and gas extraction experts who discussed the best options for reducing the explosive risk. It was decided that the trenches and conduits did pose a serious threat to safety in terms of creating a pathway for the gas which could lead to gas build-up in the electrical equipment. To combat this risk the decision was made to install gas ventilations cages on all our electrical equipment which had trenches and conduits running into them as can be seen in the photo 1.

The explosive risk of landfill gas also highlighted the need to only engage contractors who have an understanding of the potential health and safety issues associated with landfill gas and have had experience working on landfills. This need became obvious when the electrical contractors tasked with installing the electrical equipment for the project did not consider the potential explosive risk created by the trenches and conduits leading into the inverters. It was Joule's own electrical engineers and gas extraction experts who identified this risk due to their experience in regards to working on landfills.



Implications for future projects

An implication for future projects is that any installation of a solar system on a landfill must take into consideration the explosive risk of landfill gas.

The solar generation system needs to be designed to meet strict safety standards and must not allow gas build up to occur in areas.

Therefore it is paramount to engage contractors who have experience working on landfills and in explosive areas. Solar developers that have only undertaken installations on virgin land may not have the required knowledge to ensure the solar generation system is intrinsically safe.

Knowledge gap

This key lesson learnt has identified a possible knowledge gap between the installation of solar generation systems on virgin land and the installation of a solar generation system on a landfill where there are explosive levels of landfill gas.

Background

Objectives or project requirements

- *Design, install and operate a 100kW pilot solar PV system that operates behind the meter by supplying the majority of the parasitic load of the biogas collection and generation system at the Wollert Renewable Energy Facility (WREF).*
- *Develop a feasibility study to help future PV developers and investors to understand the technical and financial feasibility of solar landfills.*

Process undertaken

- *Operation and maintenance of the solar PV system*
- *Monitoring and reporting the output of the system*



Supporting information

Photo 1 – Gas ventilation Cage



Photo 2 – Completed project

