

Questions & Answers on licence application DIR 230 – Fermentation of straw-derived sugars using a genetically modified (GM) bacterium (*E. coli*) for hydrogen production

What is this application for?

Hydgene Renewables Pty Ltd is requesting a licence to optimise the fermentation process of straw-derived sugars for hydrogen production by a GM bacterium (*Escherichia coli*). The trial would be conducted at Lyndhurst, Blayney Shire Council, New South Wales. The GM *E. coli* would be cultured in a closed cartridge system and this licence would be authorised for a period of 5 years.

How has the GM bacterium been modified?

The GM *E. coli* is derived from a common laboratory strain that has been extensively used in research settings and has been shown to be safe. It has been modified to improve the ability of the bacteria to produce hydrogen and use a broader source of sugars. Some of these genes are native *E. coli* genes introduced or modified to increase their expression, and others are derived from the microalgae *Chlamydomonas*. Some genes have also been deleted to promote hydrogen production.

The GM *E. coli* also contains selectable marker genes. These genes confer antibiotic resistance. They were used to select *E. coli* during laboratory development and do not have any function beyond the initial selection process.

What is the purpose of the trial?

The fermentation trial will be undertaken to evaluate the performance of the GM *E. coli* in hydrogen production on a large scale. The aim is to determine whether this system can be used in the future as a clean energy source. The GM *E. coli* would be contained in a closed system and would not be purposefully released into the environment.

What controls are proposed for this release?

The consultation Risk Assessment and Risk Management Plan (RARMP) prepared for this application concluded that the trial poses negligible risks to people or the environment. However, as this is a trial under limited and controlled conditions, a number of licence conditions have been drafted to restrict when and where the trial can take place, limit the size of the trial, and restrict the GMOs to the deployment location only. For example, there are conditions to isolate the GM bacteria by immobilising them in hydrogel beads within sealed canisters, to securely transport and store the GMOs, and to inspect the system culturing the GMOs regularly for leaks. Full details of the draft licence conditions are available in the consultation RARMP.

How can I comment on this application?

The full consultation RARMP and a summary of the RARMP for application DIR 230 are available on the [OGTR website](#) (search DIR 230), the [consultation hub](#) or via the contacts listed below. You are invited to submit your written comments (via the [consultation hub](#) or by email) on the consultation version of the RARMP, related to any risks to the health and safety of people or to the environment from the proposed trial. Comments must be received by the close of the consultation period on **7 December 2026**.

What are the next steps in the evaluation process?

The RARMP will be finalised, taking into account submissions related to the protection of people or the environment. A de-identified summary of all comments received and consideration of those comments is included in the Appendices to the final RARMP. The finalised RARMP will inform the Regulator's decision on whether or not to issue a licence.

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