



Decarbonising natural gas generators

Background

This project developed a system that lets existing natural gas power plants run partly on ammonia, a low-carbon fuel. The system can be added to generators that are already in use, which means companies don't need to replace their equipment to cut emissions. The work was led by the **University of Nottingham** in partnership with the company **Blue-Drive Propulsion Ltd.**

The challenge

Natural gas power plants must **cut carbon emissions quickly**. **Ammonia offers a promising solution** because it can be produced sustainably and does not emit CO₂ when burned. This project developed:

- An **ammonia fuel delivery system** for a 1.2 MW Caterpillar generator
- A control and monitoring system to **keep combustion safe and emissions low**

This retrofit approach is **cheaper and faster** than building new infrastructure and could be **deployed to more than 40 UK sites**.

What's innovative about this project?

A modular, retrofittable ammonia system was designed. The team used computer modelling to ensure proper fuel mixing. A prototype was built and the patent process was started.

Next steps

Test the system in a lab, then on a real generator, and work with potential customers (such as ports and industry) to prepare for rollout.

Why this matters for the East Midlands

The UK has many natural gas generators that **provide backup power** for data centres, factories, and utilities. Ammonia could become a **major clean fuel** because it's cheaper to store and transport than hydrogen. But **solutions for retrofitting existing equipment are still very new**.

By proving that ammonia co-fueling works **safely and efficiently**, this project could influence UK energy policy, keep infrastructure in use for longer, and help the **UK lead globally in clean power technology**.

Key achievements

- Designed an ammonia injector
- Ran computer modelling to test performance
- Developed a fuel control system
- Began prototype manufacturing

"The project funding supported the advancement of an engineering idea into a working prototype, paving the way for intellectual property that could soon be commercialised." - Dr Ajith Ambalakatte, Principal Investigator