



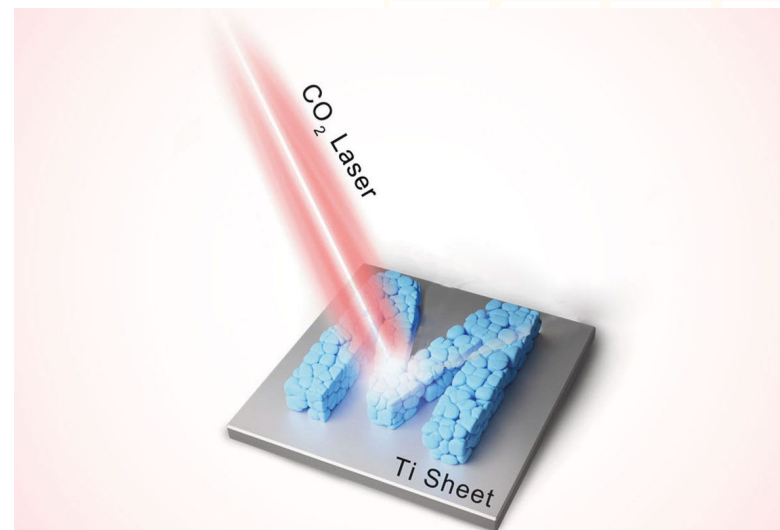
# Making ammonia production greener

Slide by Neil Goalby. Available from [rsc.li/47nioJy](https://rsc.li/47nioJy)

Researchers used lasers to convert lithium oxide into metallic lithium. When exposed to air, metallic lithium reacts easily with nitrogen, breaking the strong nitrogen–nitrogen triple covalent bond, and generating lithium nitride.

This salt reacts with water to produce ammonia and lithium hydroxide at very high yields. The new process uses mild conditions and so offers a green alternative to the Haber process.

The Haber process is very energy intensive as it operates at high temperature and pressure and contributes to high carbon dioxide emissions.



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*Could lasers point the way to a greener, more sustainable way of producing fertilisers?*

## Questions

1. Why is nitrogen an unreactive gas?
2. Write a balanced equation for the reaction between  $\text{Li}_3\text{N}$  and water.
3. Explain why this process may have a lower carbon footprint than the Haber process.