

Electrochemical nitrogen reduction to ammonia

What do you do?

- Work in a team on a new nitrogen activation and ammonia electrocatalysis method
- Electrochemistry, materials, experiments, design, modeling, spectroscopy, and more...

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A power plant as a super-battery

Nuon and Delft University of Technology are willing to use gas-fired power plants as storage facilities for renewable energy. They aim to do so by producing ammonia from renewable energy whenever there is a surplus. Ammonia is easy to store on a long-term basis. The ammonia can then be used as fuel in gas-fired power plants at times when there is a shortage of renewable energy.

Wind and solar energy are not available on demand...

Sometimes too much is produced...
The supply of wind and solar energy exceeds the demand.

Now:
The surplus is sold at very low prices and consumed elsewhere.

...while at other times there is a shortage
Demand is greater than the production of renewable energy at that moment.

Nu:
Gas-fired power plants make up the deficit by producing electricity using natural gas.

In the future:

- 1 The stored ammonia will be used as fuel instead of natural gas.
- 2 No CO₂ will be released when ammonia is burned.

- Renewable electricity + water and nitrogen for production of NH₃
- Ammonia as very large scale storage option
- Can be used to generate electricity later on (figure from Nuon)
- CO₂ neutral
- High energy density
- Abundant materials

