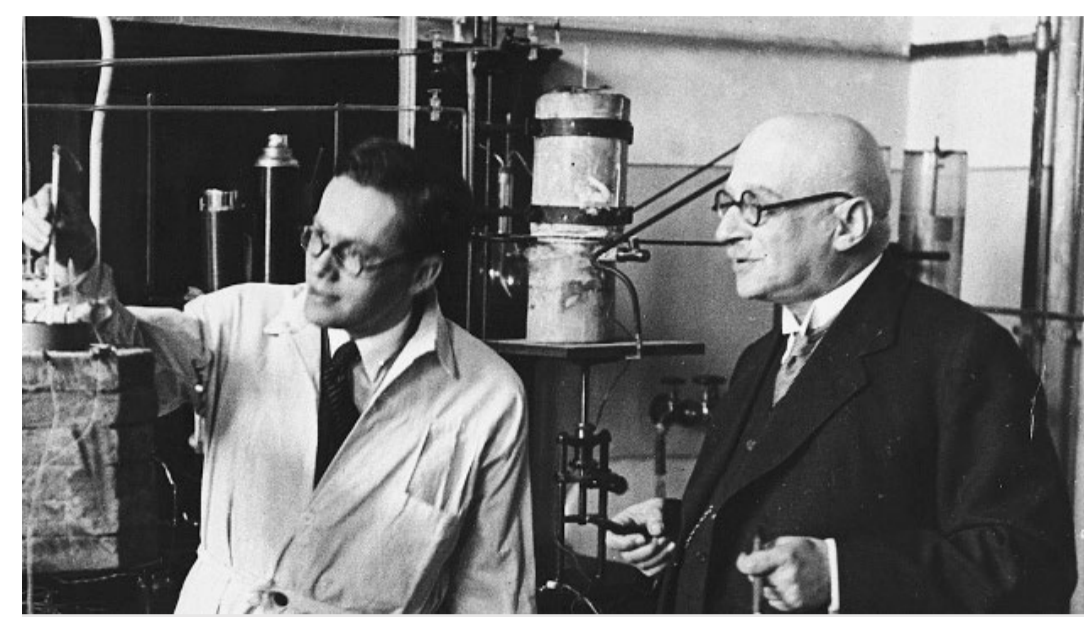


# Multiphase Electrolysers for Renewable Ammonia Production (OzAmmonia technology)

This Project received funding from ARENA as part of ARENA's Hydrogen R&D 2023 funding round. The views expressed herein are not necessarily the views of the Australian Government, and the Australian Government does not accept responsibility for any information or advice contained herein.

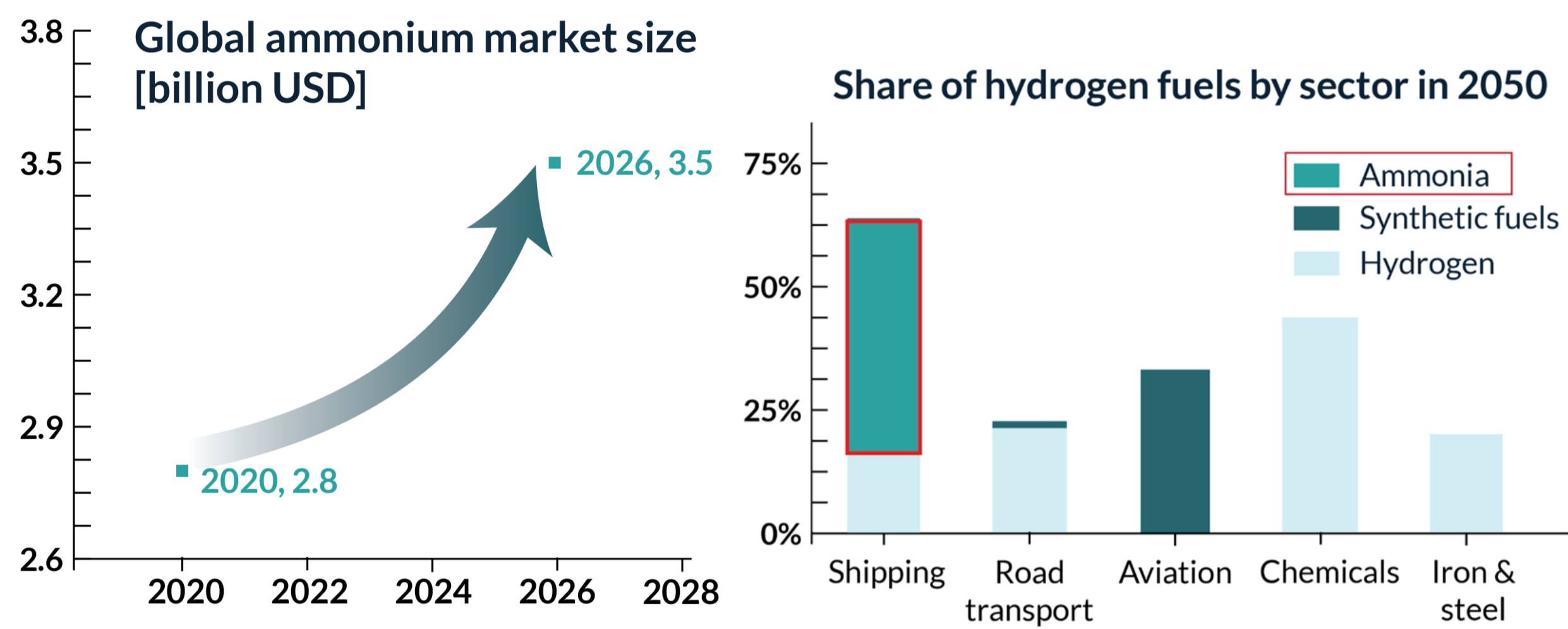
## Background & Overview



Prof Fritz Haber (right side) works in lab, who is the inventor of Haber-Bosch industrial ammonia production process.

Conventional ammonia production through Haber-Bosch process :  
**High energy consumption ; High CO<sub>2</sub> emission ; High fossil fuel dependency ; Intensive resource requirement.**

Economic demand for renewable ammonia as **fertiliser & energy vector.**

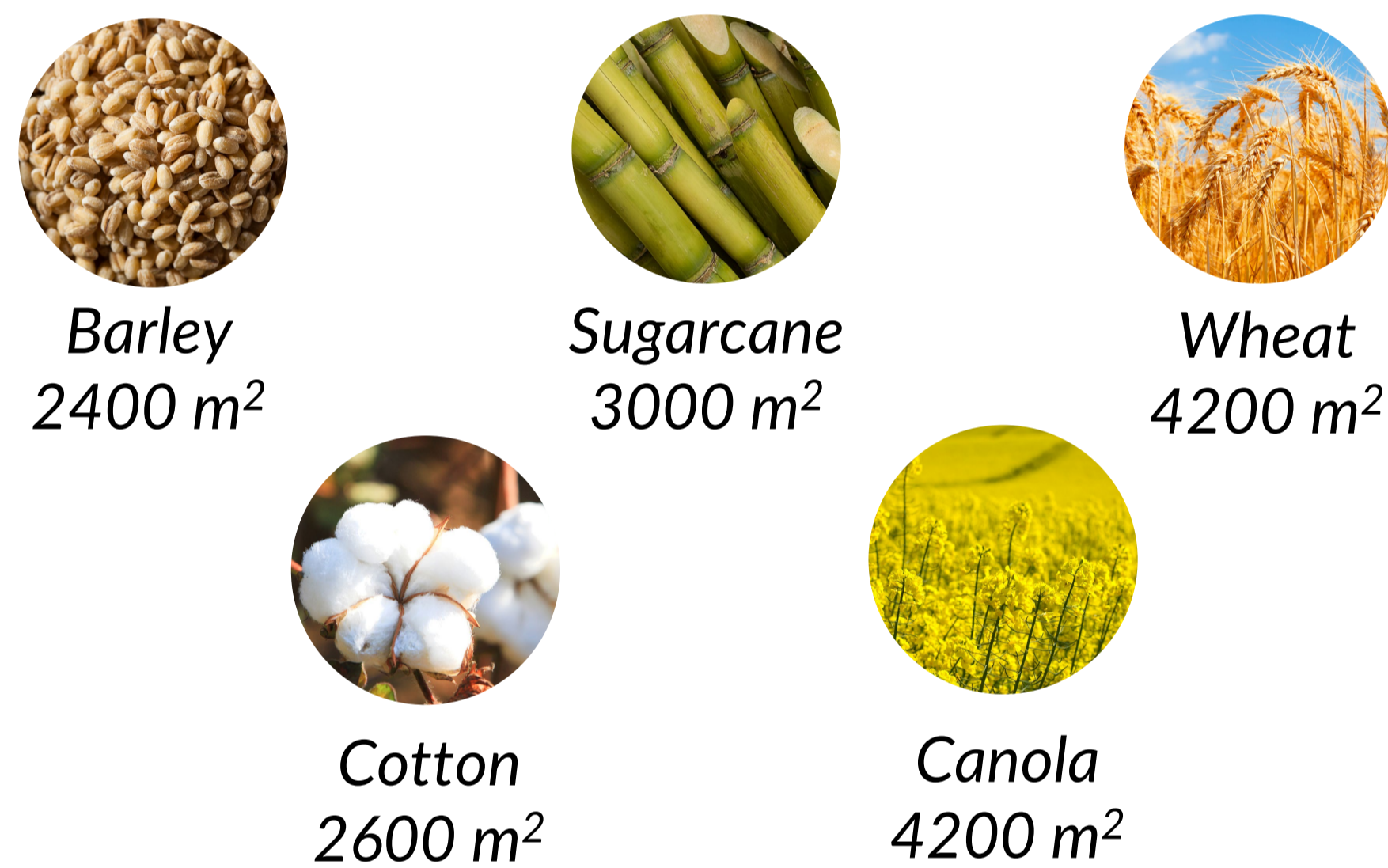


Source: Market Analysis Report, Grand view research.

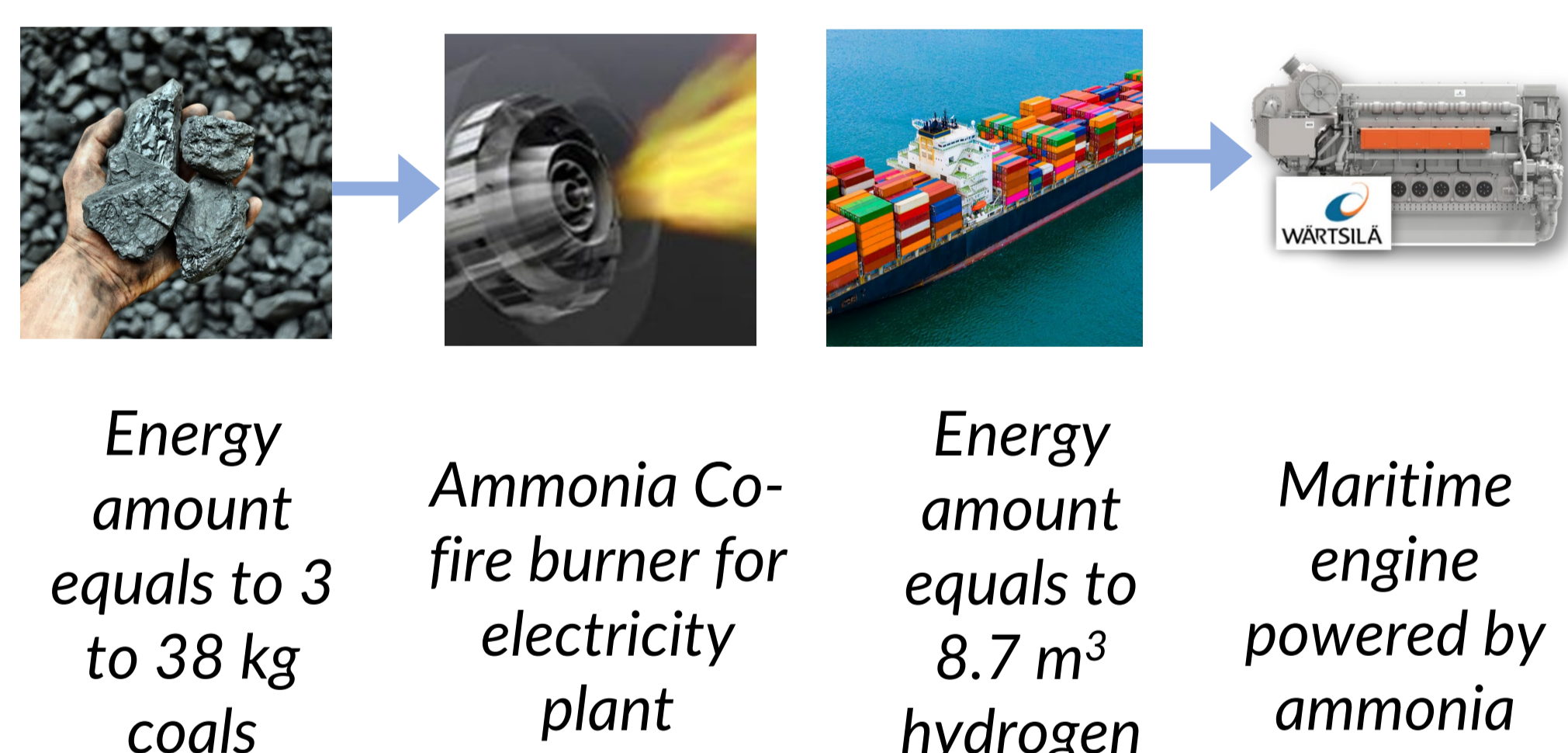
Source: International Energy Agency (IEA).

Proposed OzAmmonia standalone prototype generates **6 kg ammonia/month** which is sufficient

to feed typical plants in Australia

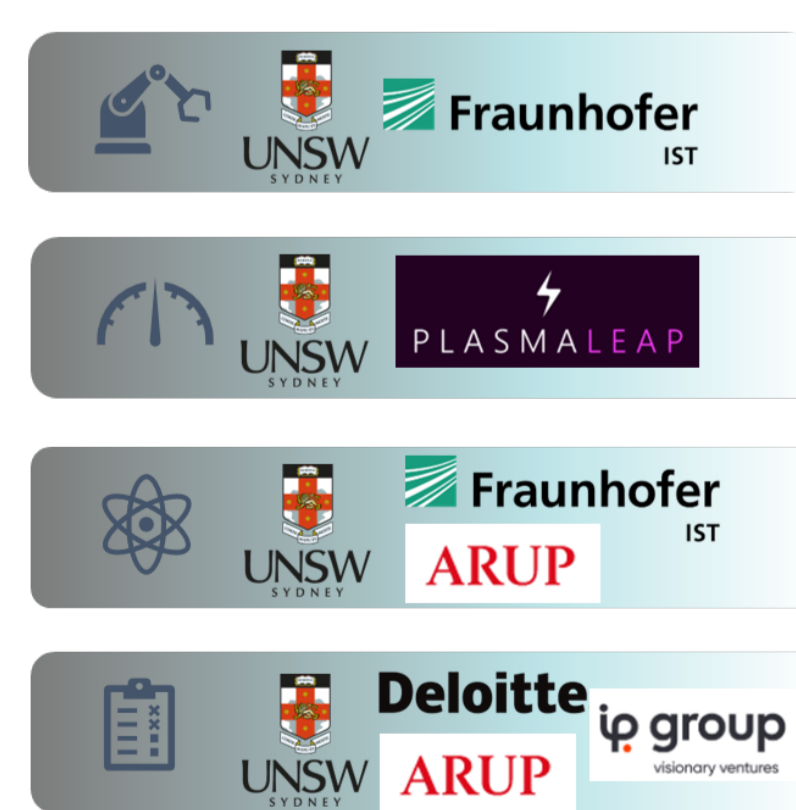


for clean energy vector



## Methods and Expected Results

### Stage 1 Core-Research Stage



#### Key activities

Multiphase electrolyser advancement incorporating optimised and scaled up electrode stacks.  
 Advanced Air Oxidation System optimisation.  
 Electrolyser integration and prototype development.  
 Business model/Scaleup plan development.

#### Expected results

Reduction of electrolyser SEC and progressively scale up electrolyser stack.  
 Reduction of SEC NO<sub>x</sub> generation.  
 TRL6 prototype development.  
 Manufacturing line design and business plan development.

### Stage 2 Research Commercialisation Stage



#### Key activities

Field testing and technology demonstration through validation of prototype.  
 NO<sub>x</sub> input optimisation to electrolyser.  
 Technology spinout by forming start up, attract investment and negotiate on Term-Sheet.

#### Expected results

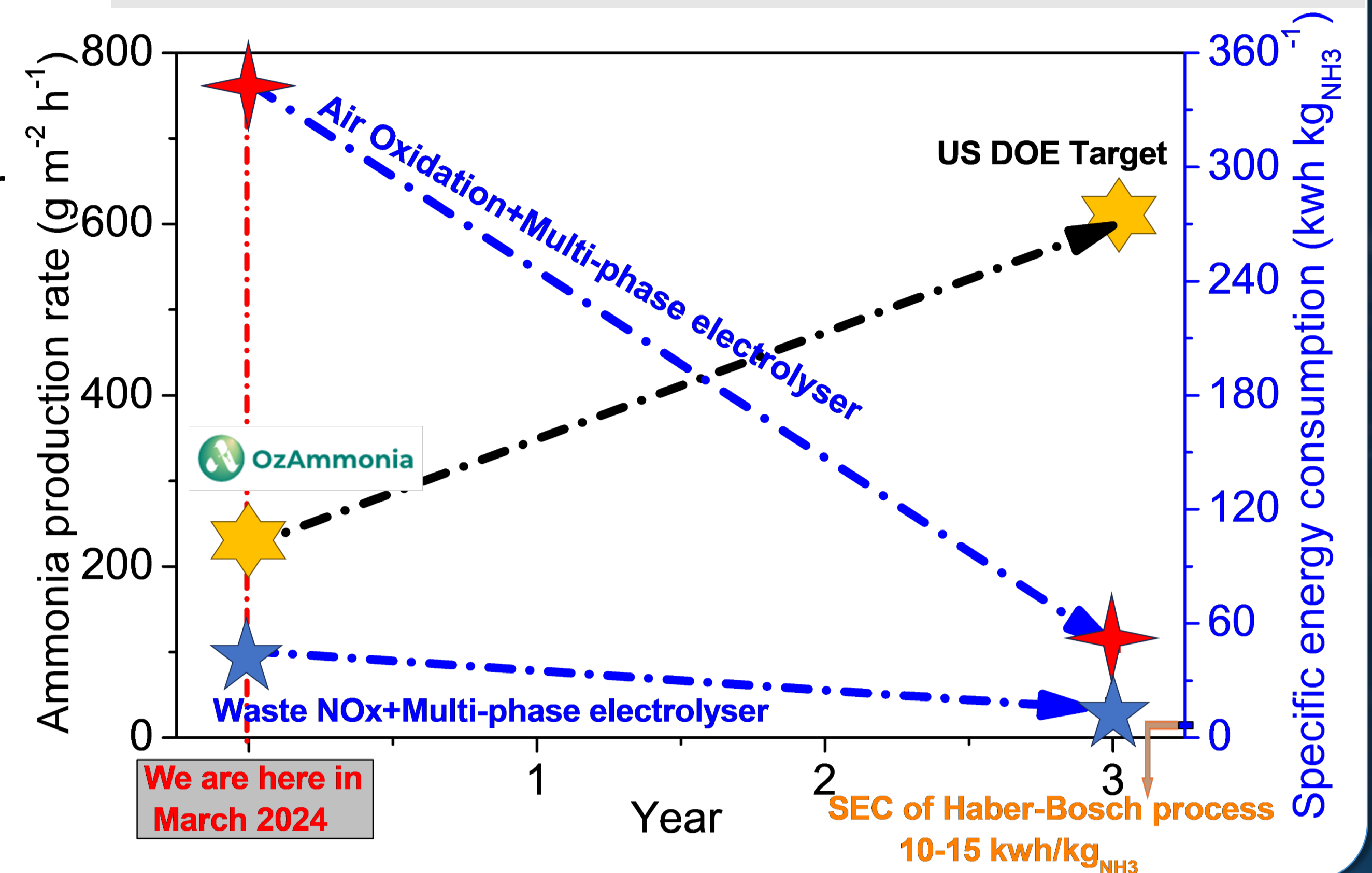
OzAmmonia TRL brought to 7.  
 Scaled up commercial units for Air-to-Ammonia and Waste-to-Ammonia systems.  
 OzAmmonia technology commercialised.

Note: Specific energy consumption is defined as SEC.

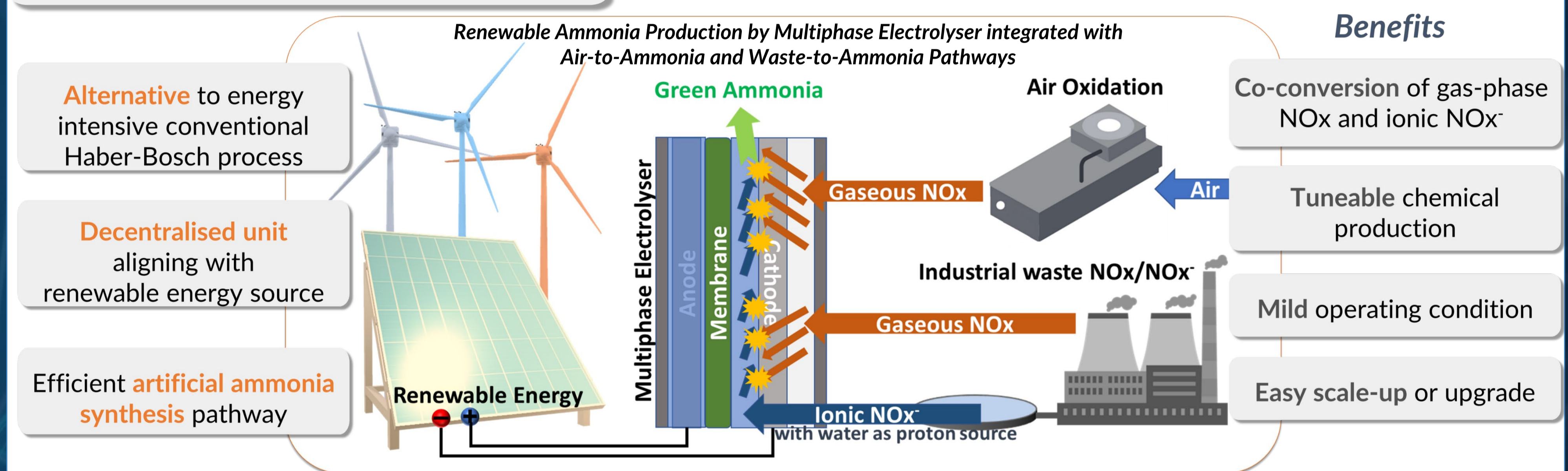
## Aims & Objectives

Advance 'air-to-ammonia' technology which directly converts air (and water) into ammonia using a hybrid advanced oxidation process in a multiphase electrolyser system.  
 Improve the current electrolysis system efficiency to reduce overall energy consumption and produce record high ammonia yield with oxides of nitrogen (NO<sub>x</sub>) from waste-flue gas and waste-water as a 'waste-to-ammonia' pathway.

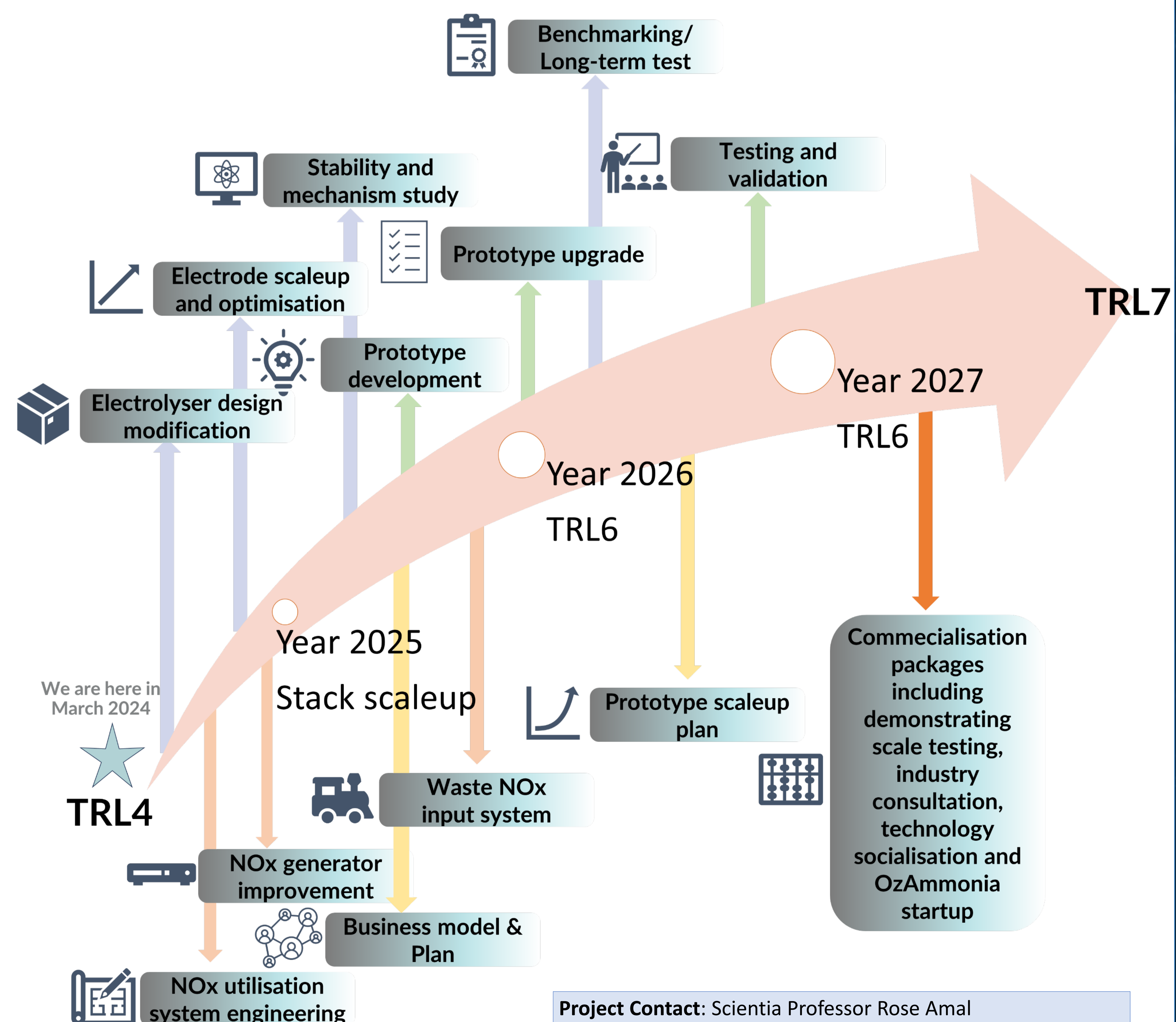
This project will elevate the Technology Readiness Level (TRL) of the innovative **Multiphase Electrolyser system** from TRL 4 to TRL 7, facilitating its pathway to commercial viability for renewable ammonia production.



## Technology Process



## Timeline



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