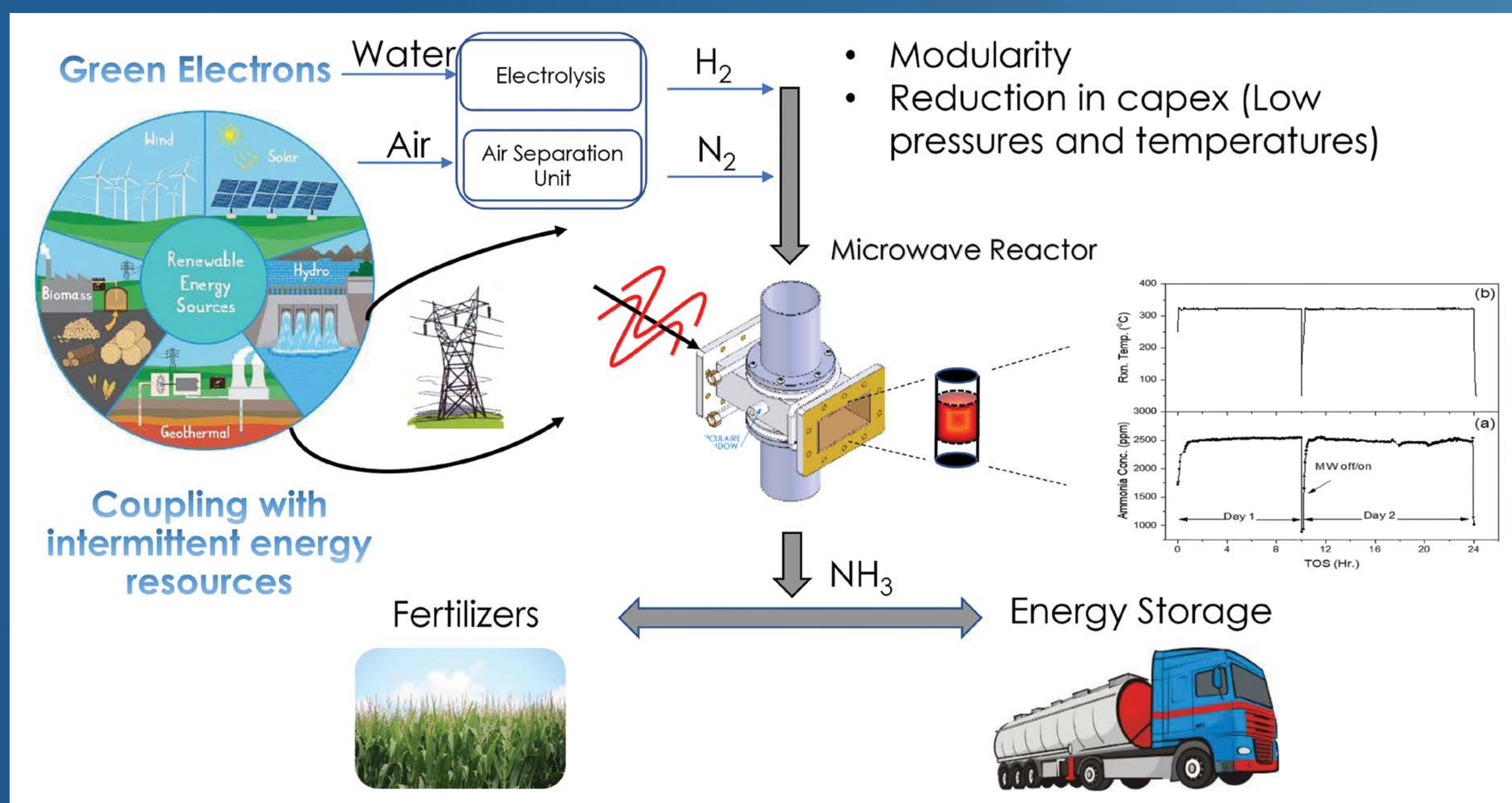


IMPROVED AMMONIA PRODUCTION PROCESS DEVELOPED IN SUCCESSFUL NETL PARTNERSHIP

NETL partnership produces ammonia at low temperatures and near-ambient pressures.

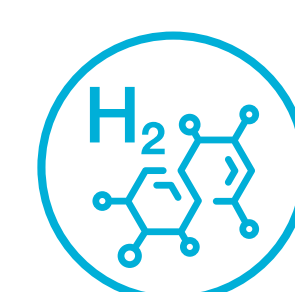


NETL ammonia (NH_3) microwave process enabling point-of-use manufacturing.

Combining cutting-edge microwave reaction science research at NETL with specialized catalyst development from West Virginia University and reactor manufacturing experience from Malachite Technologies created the award-winning Microwave Ammonia Synthesis (MAS) process.

- Conventional reaction processes often rely on conduction, convection and radiation to heat catalyst vessels at high pressures to synthesize ammonia.
- The MAS process, however, uniquely uses microwaves to selectively heat the catalyst directly.
- The new technology is energy efficient, cost effective and capable of using intermittent renewable power.
- The MAS process is also modular, with smaller-scale ammonia plants that allow for greater flexibility.
- Ammonia can be used as a hydrogen carrier, which will increase in importance as the nation transitions to a clean hydrogen economy.

RESEARCH PRIORITY



HYDROGEN WITH CARBON MANAGEMENT

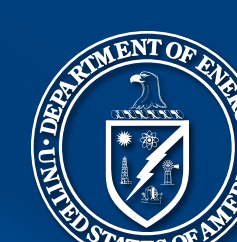
PERFORMERS



West Virginia University



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