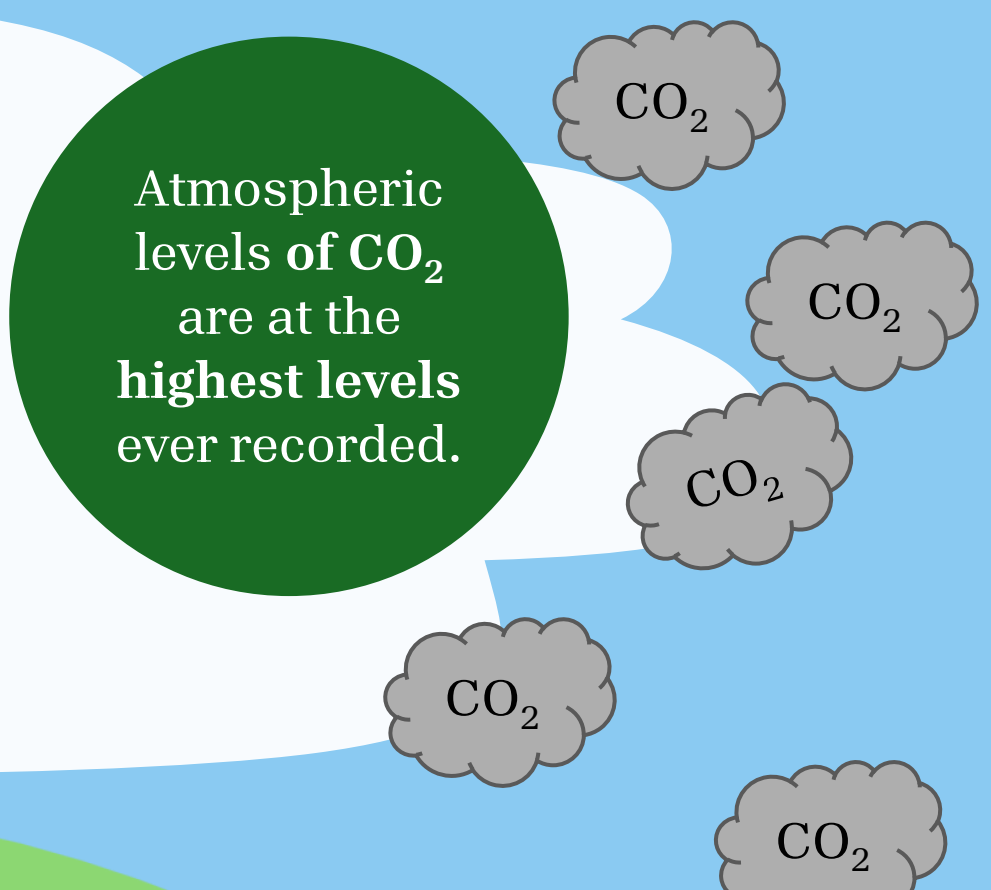


# Giving wind turbine blades a second life as carbon-locking biochar

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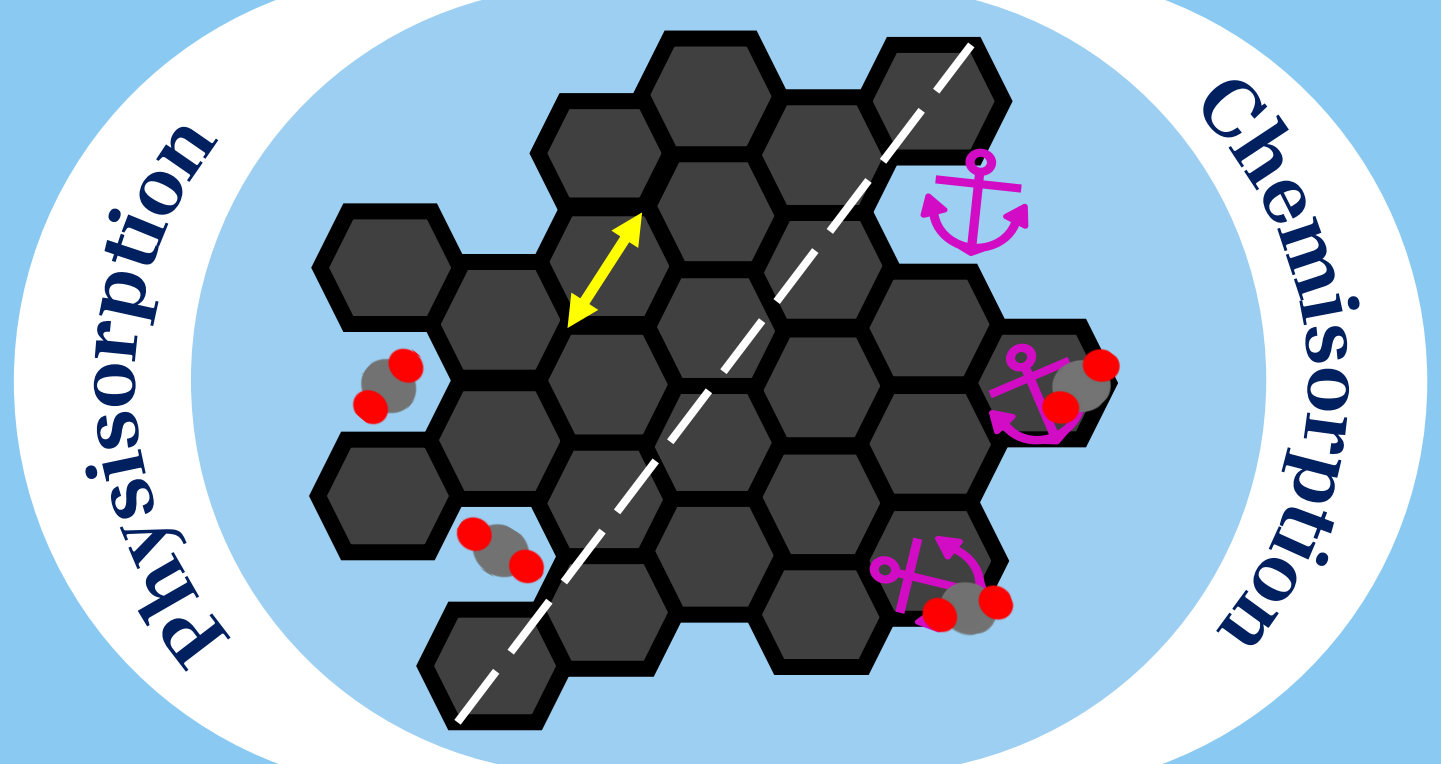
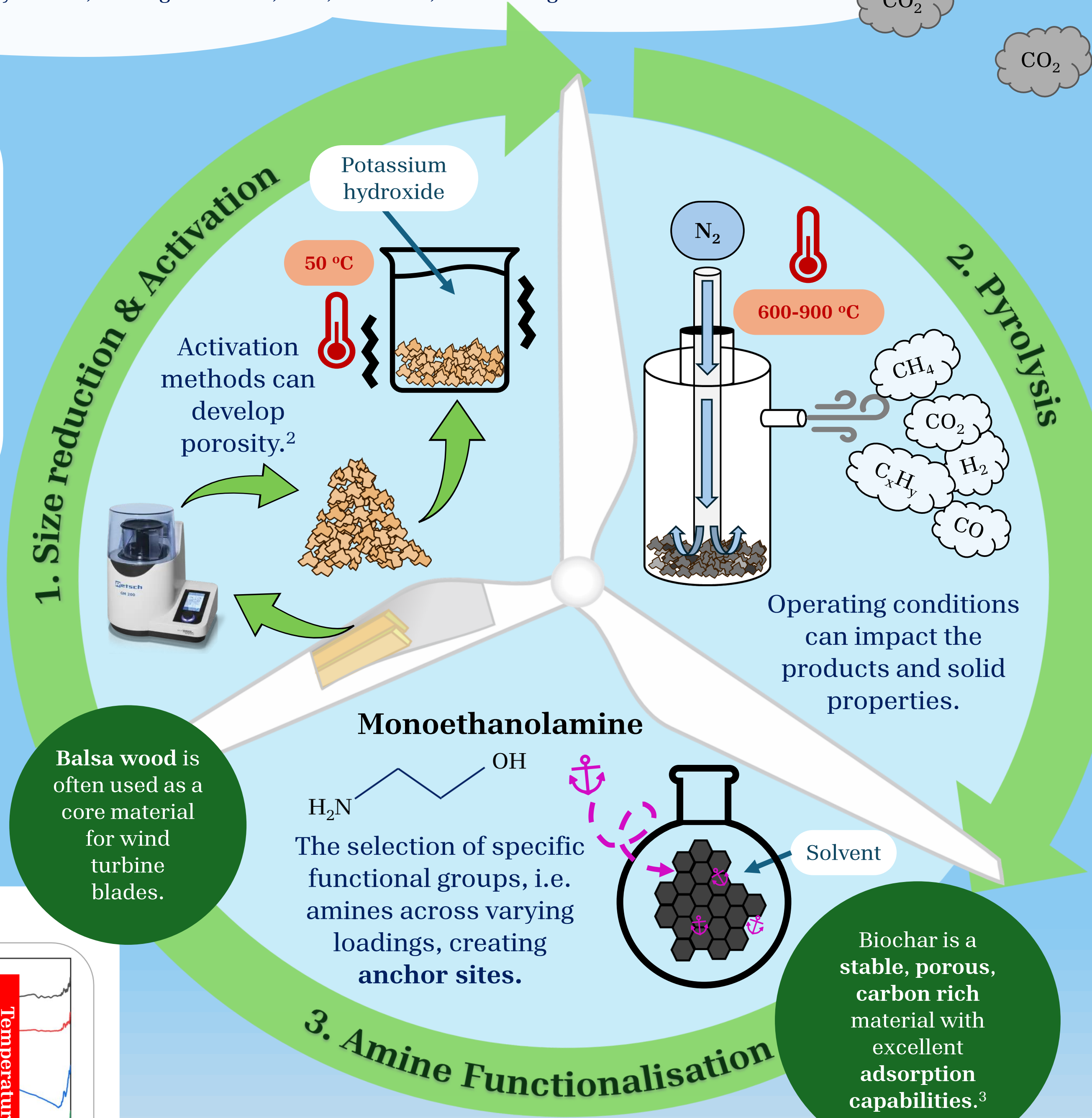
<sup>b</sup> School of Engineering and Technology, Chemical Engineering, University of Hull, Cottingham Road, Hull, HU6 7RX, United Kingdom



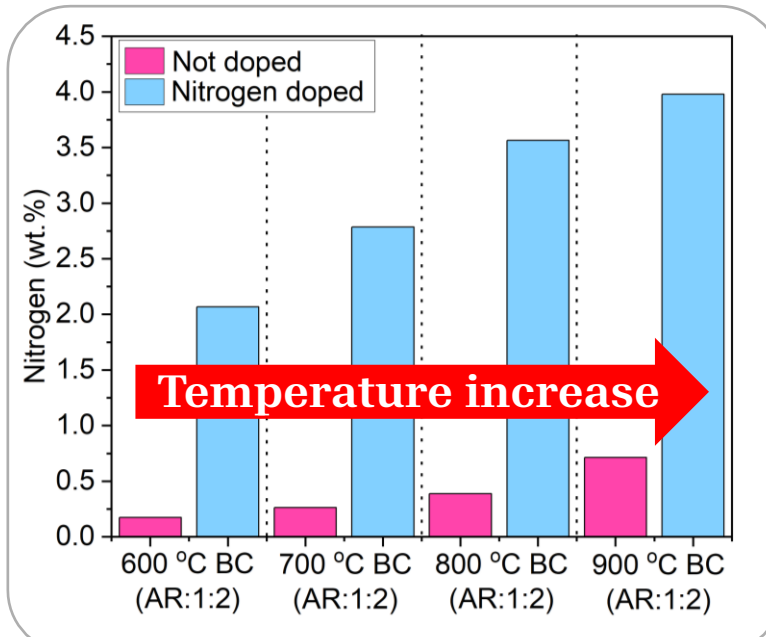
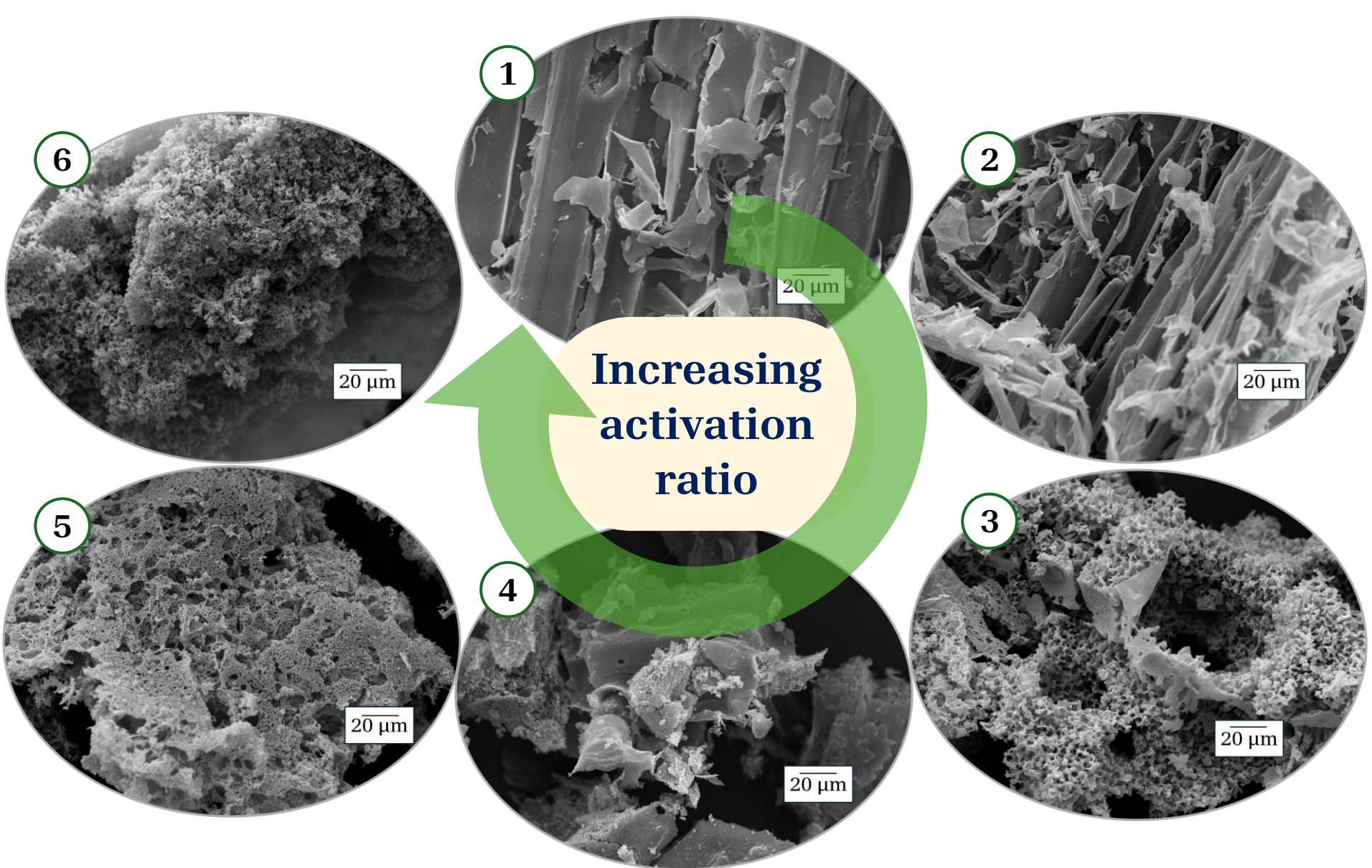
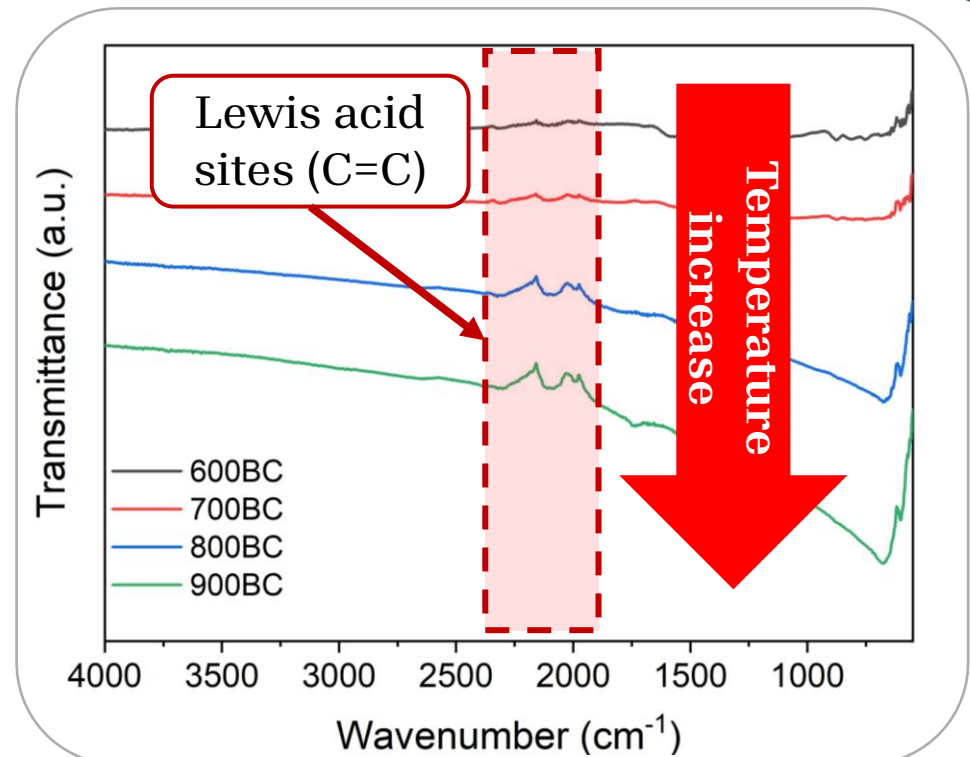
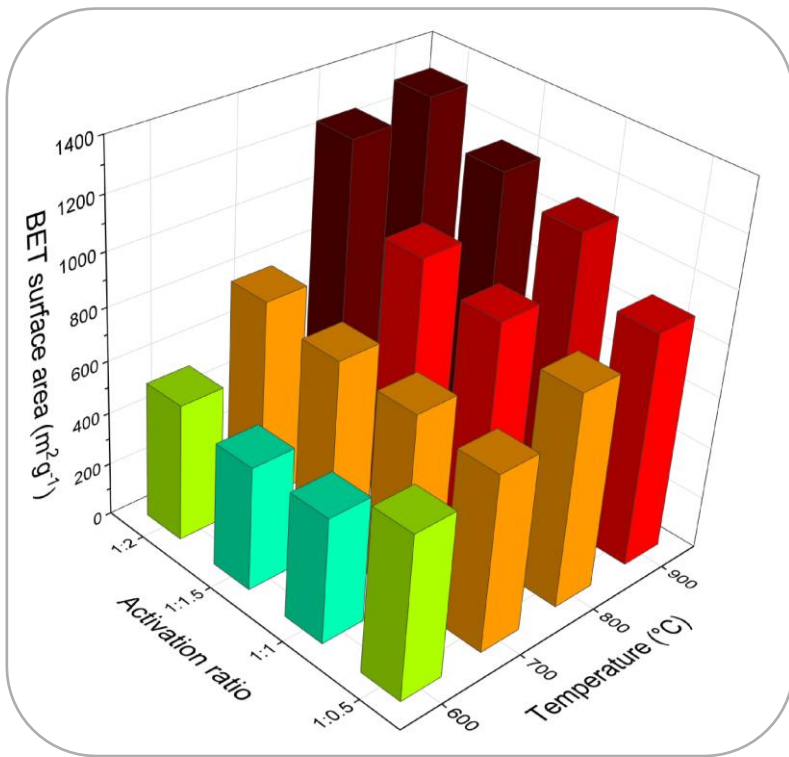
## Motivations

Wind turbine blades generate waste at end-of-life, comprised of composite materials which mostly ends in landfill or incineration.<sup>1</sup>

- Balsa wood, a core material of turbine blades, is a lignocellulosic biomass source which can be upcycled through pyrolysis to create lignin derived biochar.
- Through thermochemical conversion, activation and functionalisation it can be upgraded for use in carbon capture – promoting carbon neutrality.



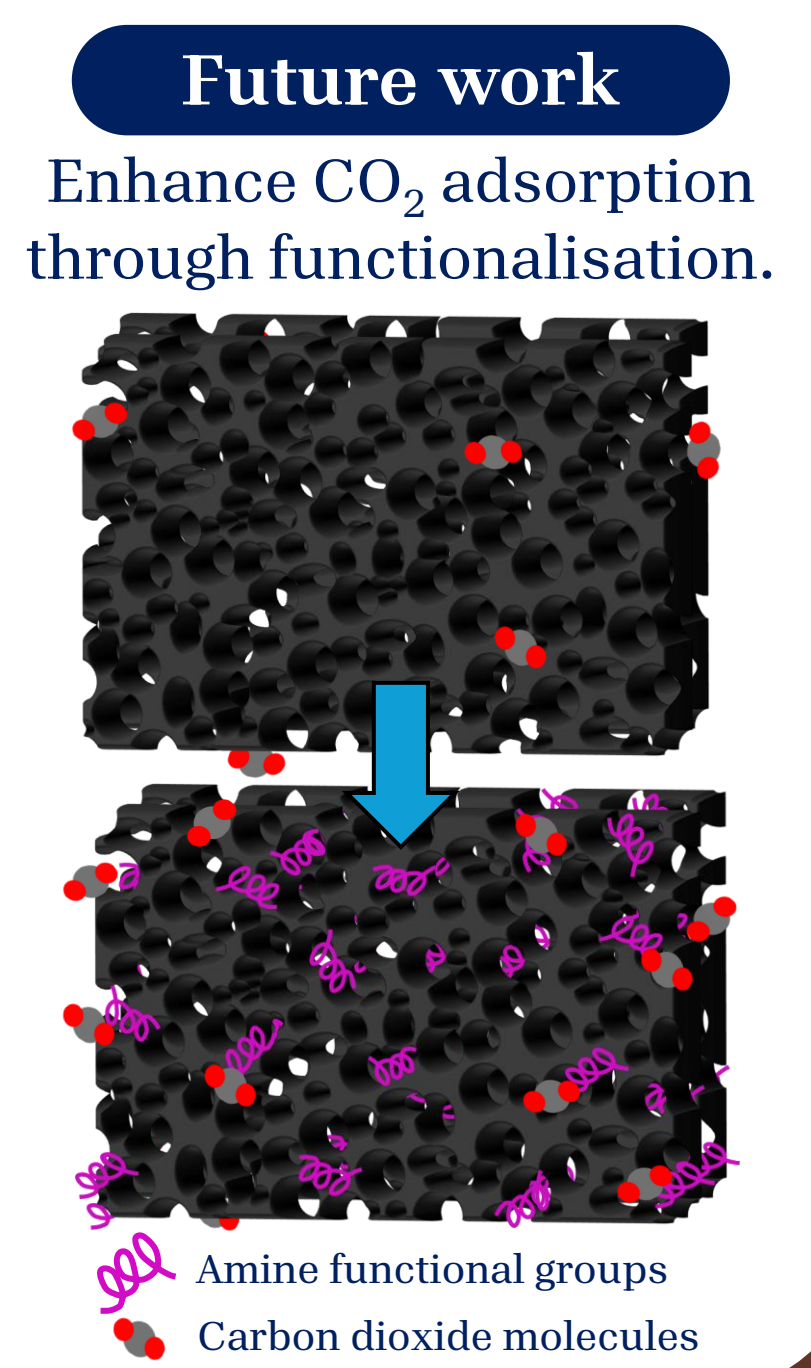
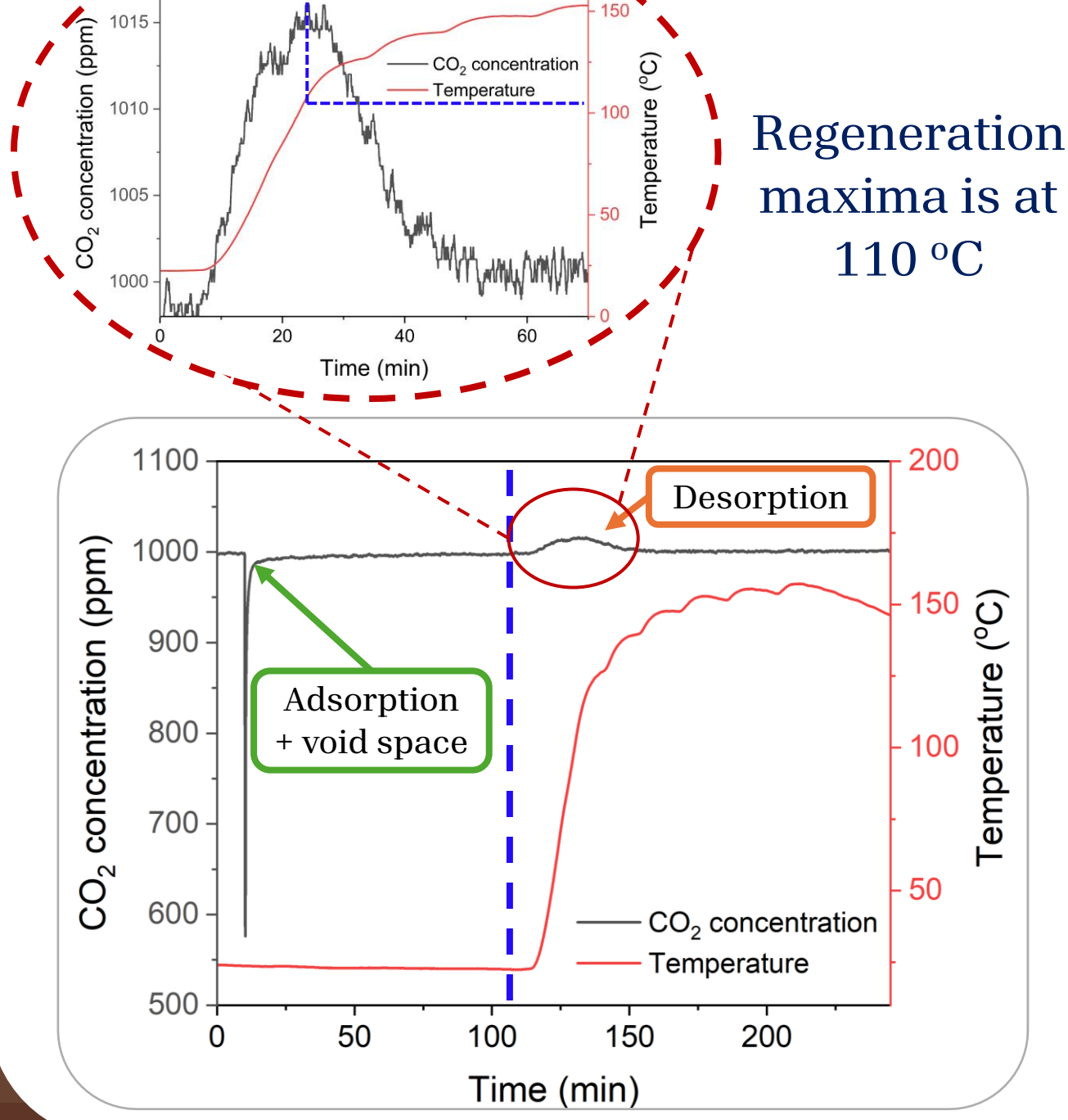
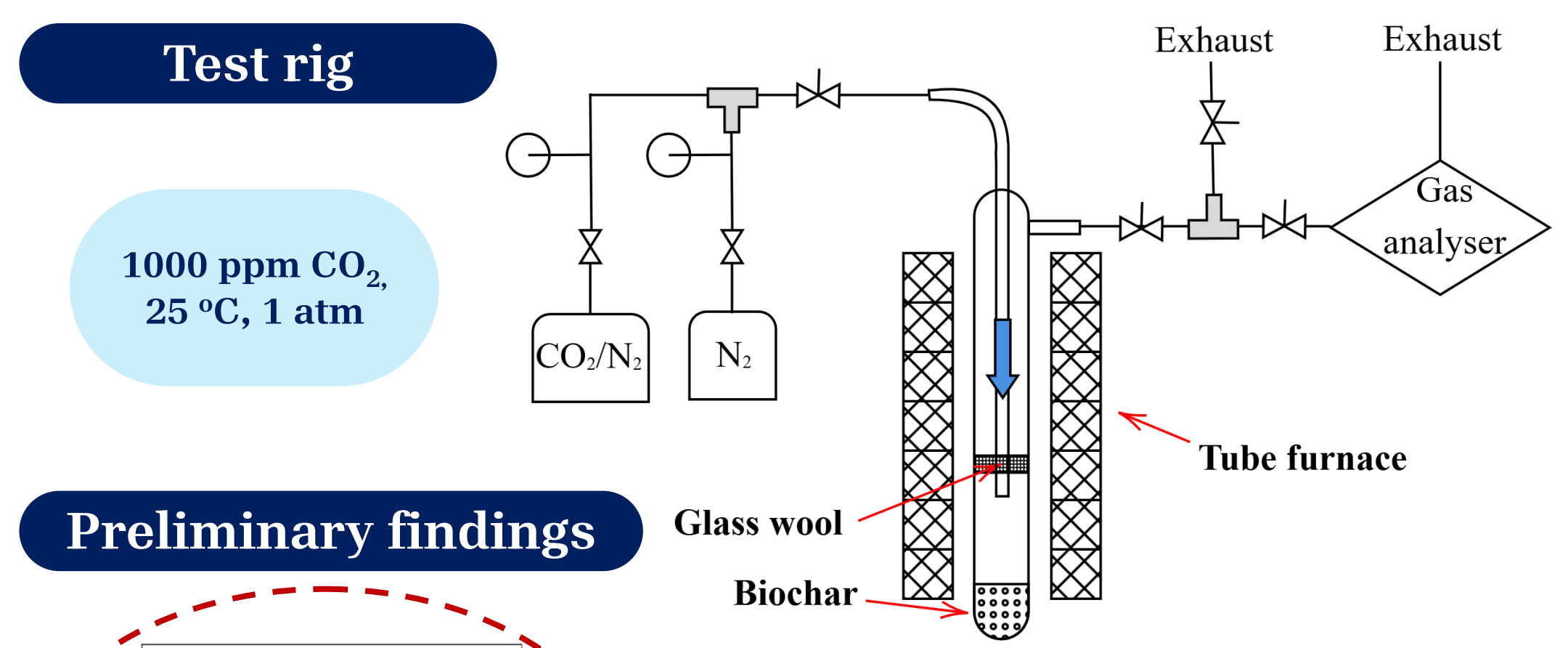
## Biochar characterisation



- Surface area rises with pyrolysis temperature and activation levels.
- Higher temperatures induce Lewis acid sites (electron acceptors).
- Carbon dioxide accepting molecules can bind to Lewis acid sites, promoting uptake.

By 2050, it is estimated there will be 43 Mt of accumulated blade waste.<sup>4</sup>

## Ambient carbon dioxide capture testing



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