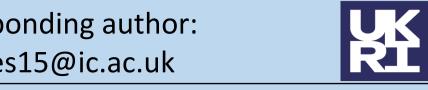
Pyrolysis of Wastes for Carbon Capture, Utilisation and Storage

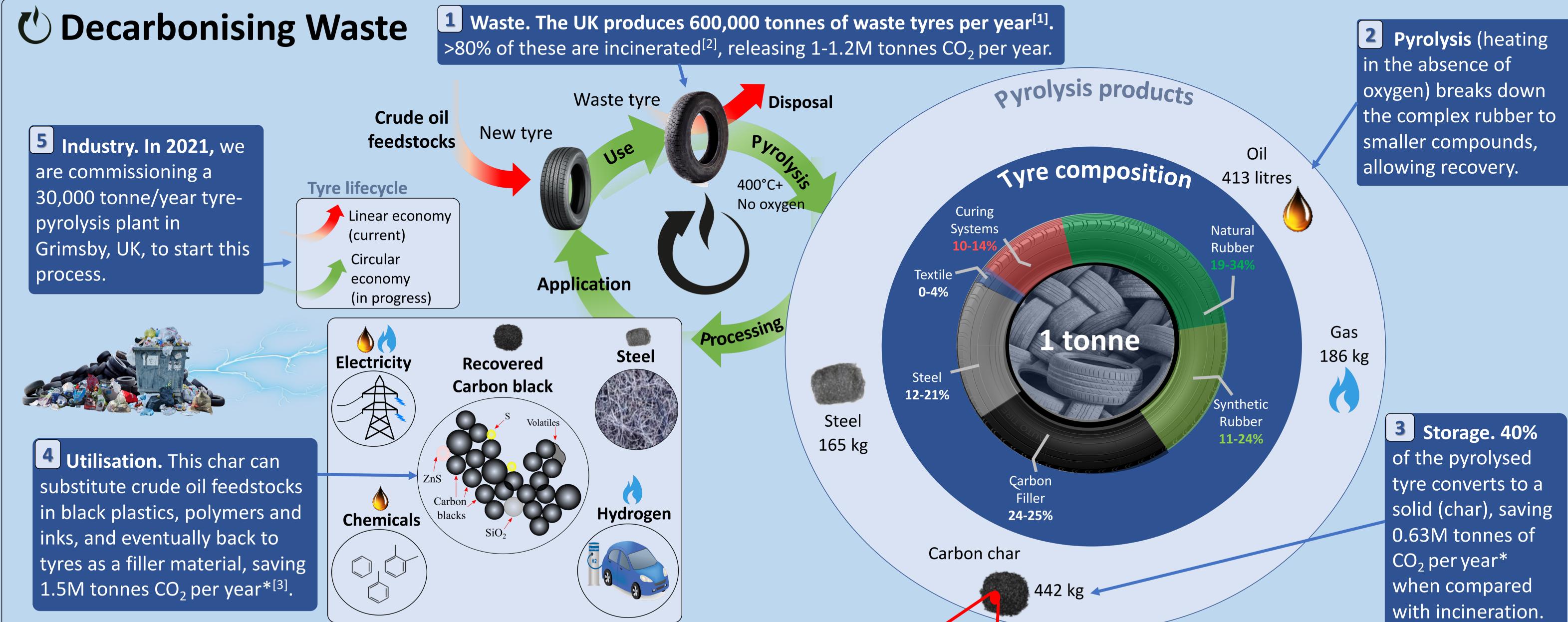
Imperial College London

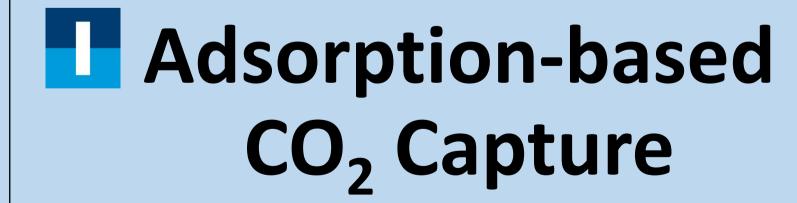
[2] = Opyrenergy

Engineering and Physical Sciences Research Council

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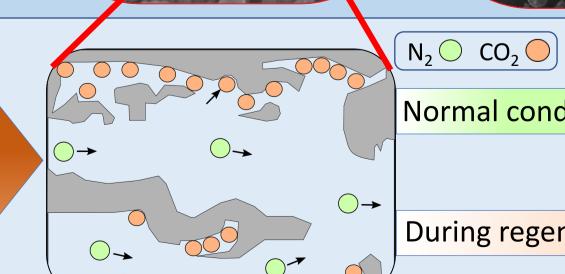
Micropores concentrate CO₂ in the carbon, filtering the gas.

Processed pyrolysis products

Regeneration causes desorption of the CO₂, allowing re-use of the adsorbent.

What if we could capture more CO₂ via pyrolysis? At Imperial College, we are developing CO₂ adsorbents from the char that Pyrenergy is producing.

CCUS system Flue gas stream 20% CO₂ (powerplant, industrial process) 80% N₂



100% N₂ Normal conditions

During regeneration 100% CO₂ Storage/utilisation

7 Preliminary results show that the tyre char can capture >10% of its weight as CO₂ reversibly and rapidly, at a competitive cost.

Sources/references

[1] = TRA. (2020). Tyre Recovery Association Private Correspondance. [2] Comtrade, U. N. (2015). UN Comtrade database. UN Comtrade Online.

[3] = Based on 0.3 tonnes CO₂/ tonne recovered vs 8 tonnes CO₂/ tonne virgin carbon black - Murphy, N. (Bolder I. (2020). rCB vs vCB: Quantifying Sustainability. Recovered Carbon Black Conference 2020.

Assumptions/abbreviations

Atmosphere

*= assuming 80% of UK tyres are pyrolysed, and half of the steel-free tyre

weight is converted to char. M = million.