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Recycling of fibre composites

Anders Sjögren

*Department of Design Sciences
Lund University, Sweden*

Disposition

- Sustainable use of fibre composites
- Recycling processes
- Future developments

Sustainable use of composites



[Farplas]

Problems with recycling

- Costly
- Degradation of the fibres
- Degradation of the matrix
- Deteriorated bonding between fibre and matrix
- Uneven quality

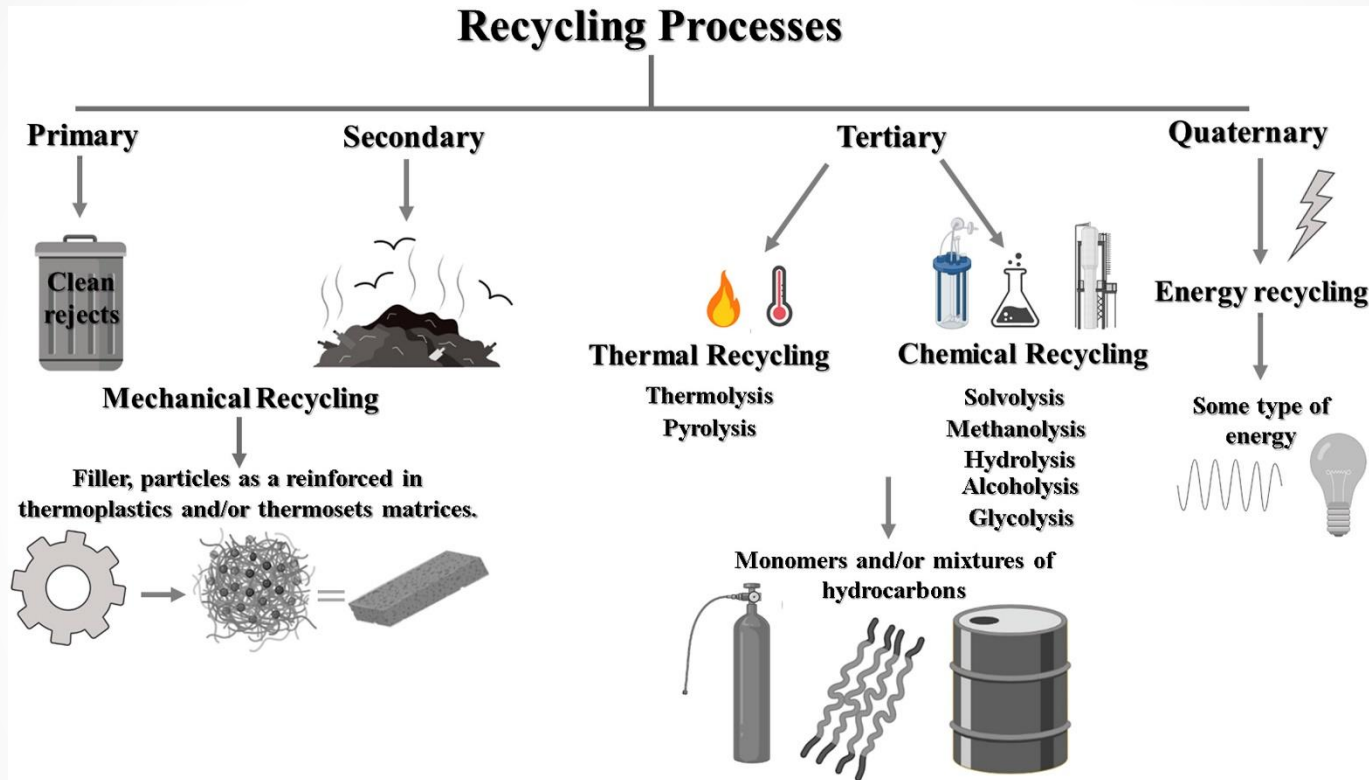


Recycling processes

- Mechanical recycling
- Physical recycling
- Chemical recycling
- Thermal recycling
- Energy recycling
- Biological degradation



Recycling processes



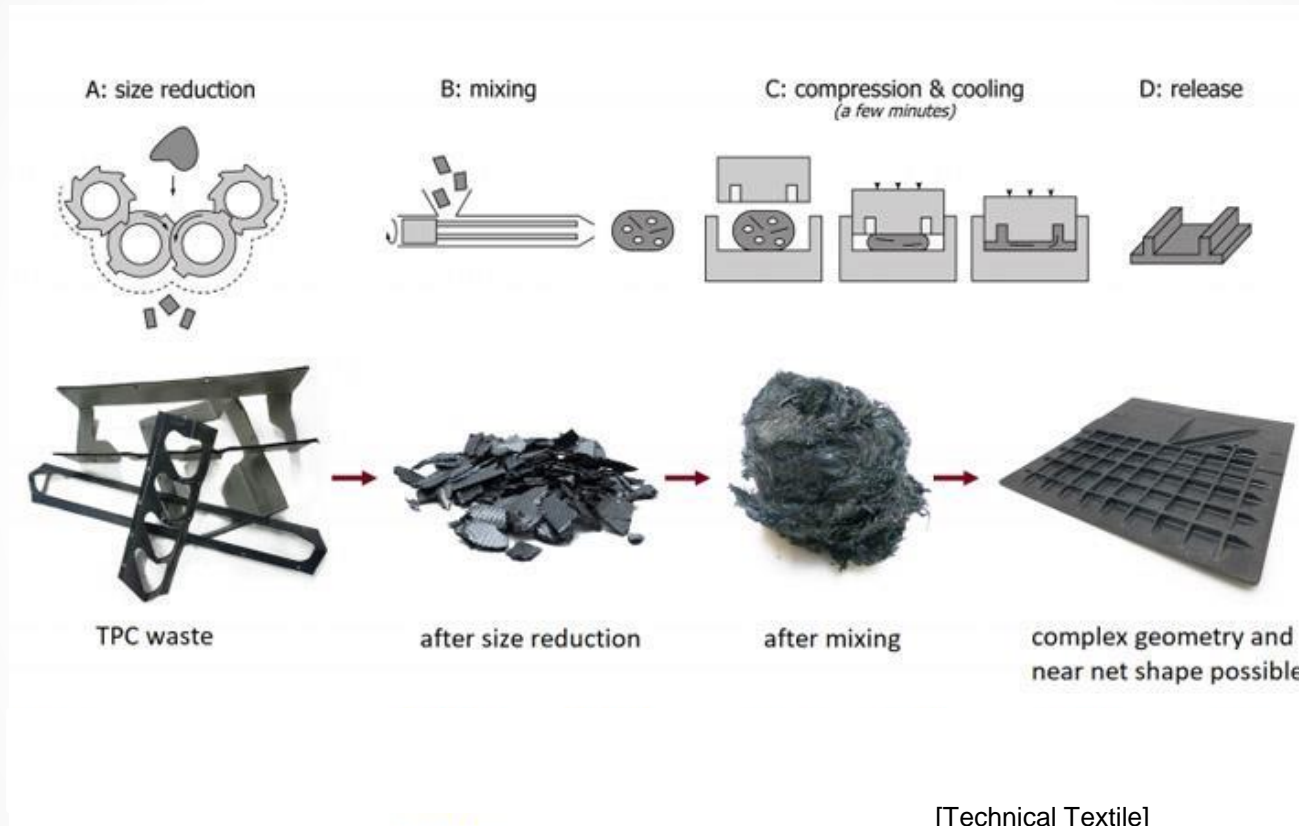
Recycling of carbon fiber-reinforced thermoplastic and thermoset composites:
A review, L.S. Montagna et al., Journal of thermoplastic composite materials, 2022.

Choice of process

- Type of material
- Volume of waste
- Area of use for the recycled material



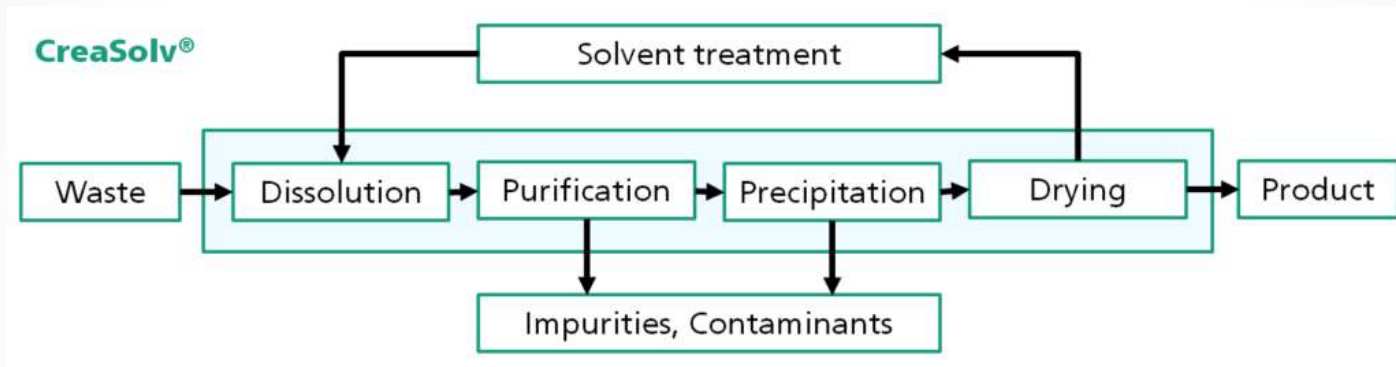
Mechanical recycling



Properties



Physical recycling

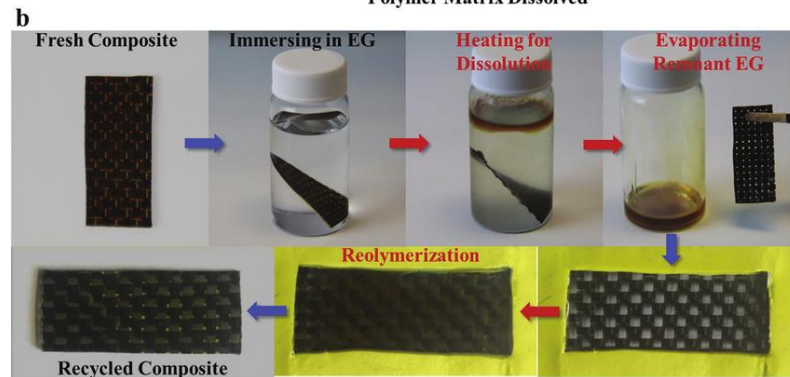
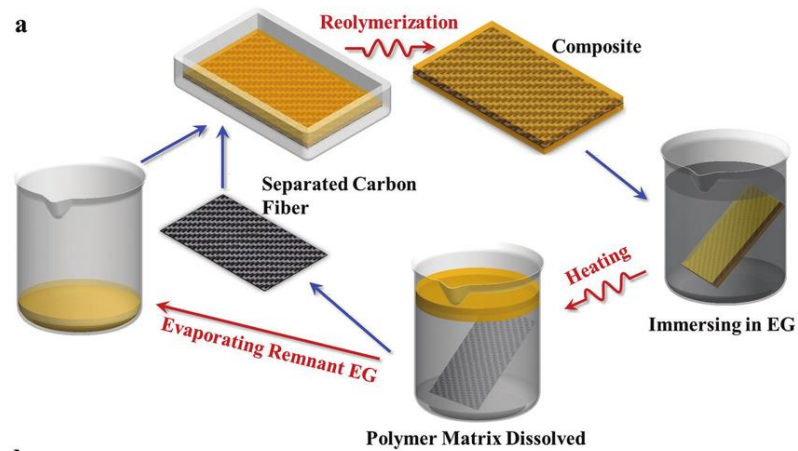


[ResearchGate]

Properties



Chemical recycling

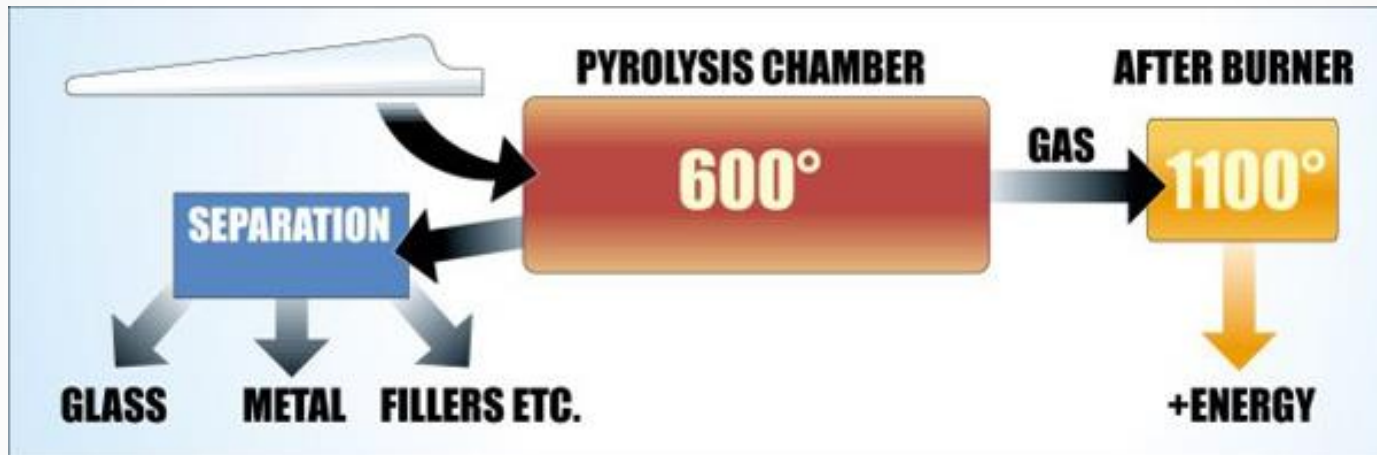


[ResearchGate]

Properties

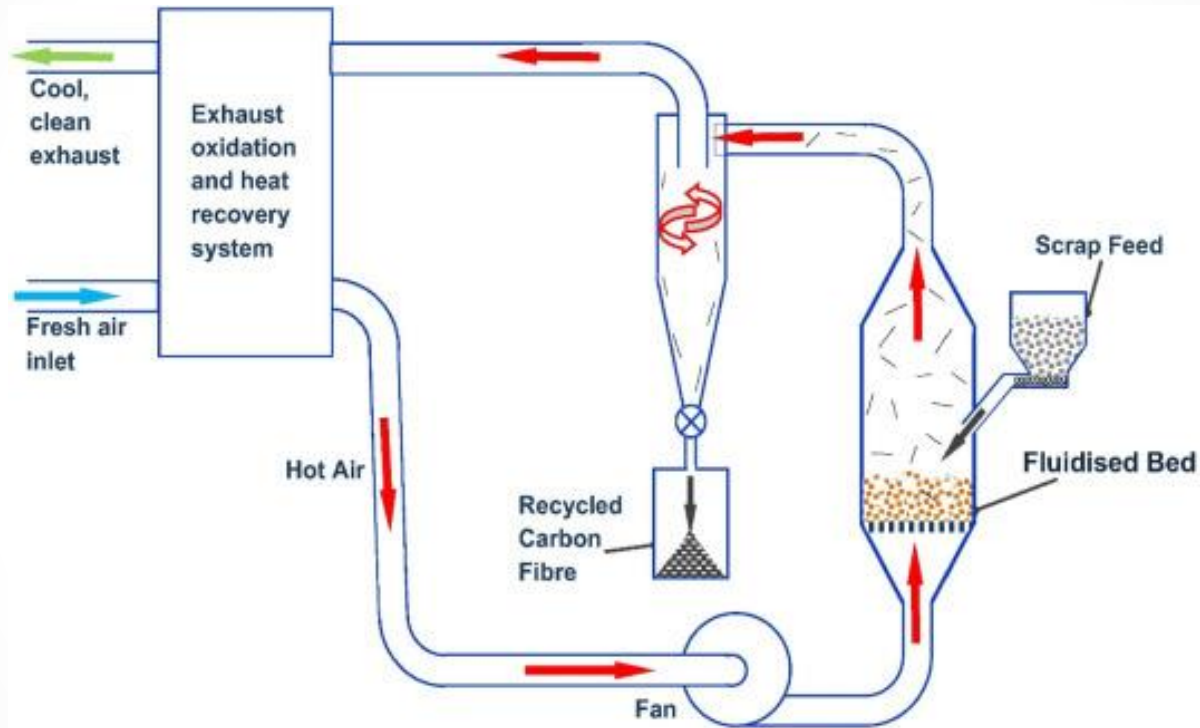


Thermal recycling



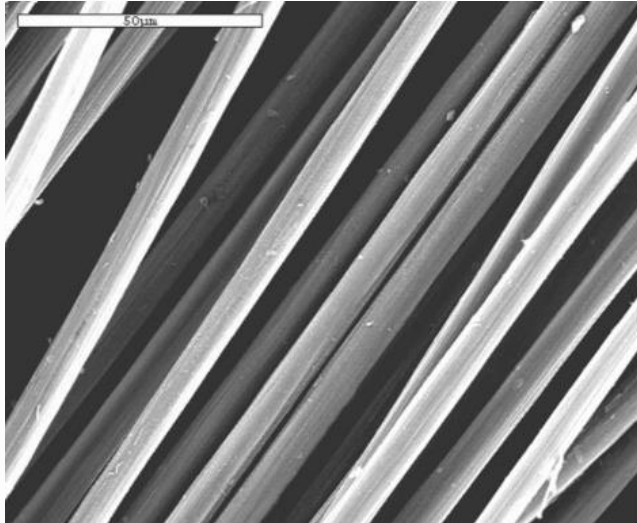
[ReFibre]

Thermal recycling

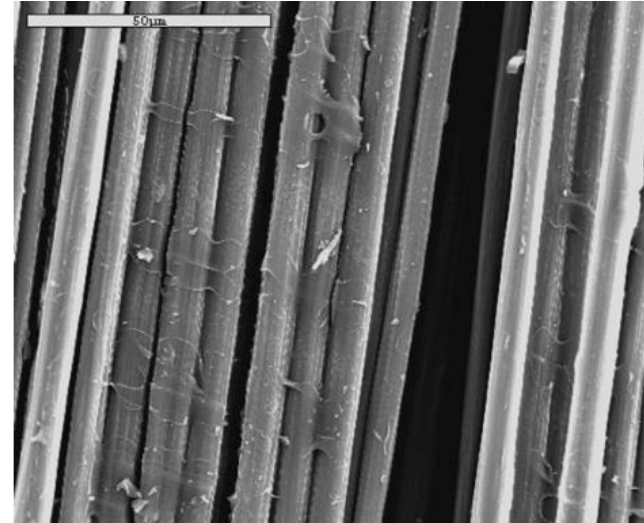


[ScienceDirect]

Properties



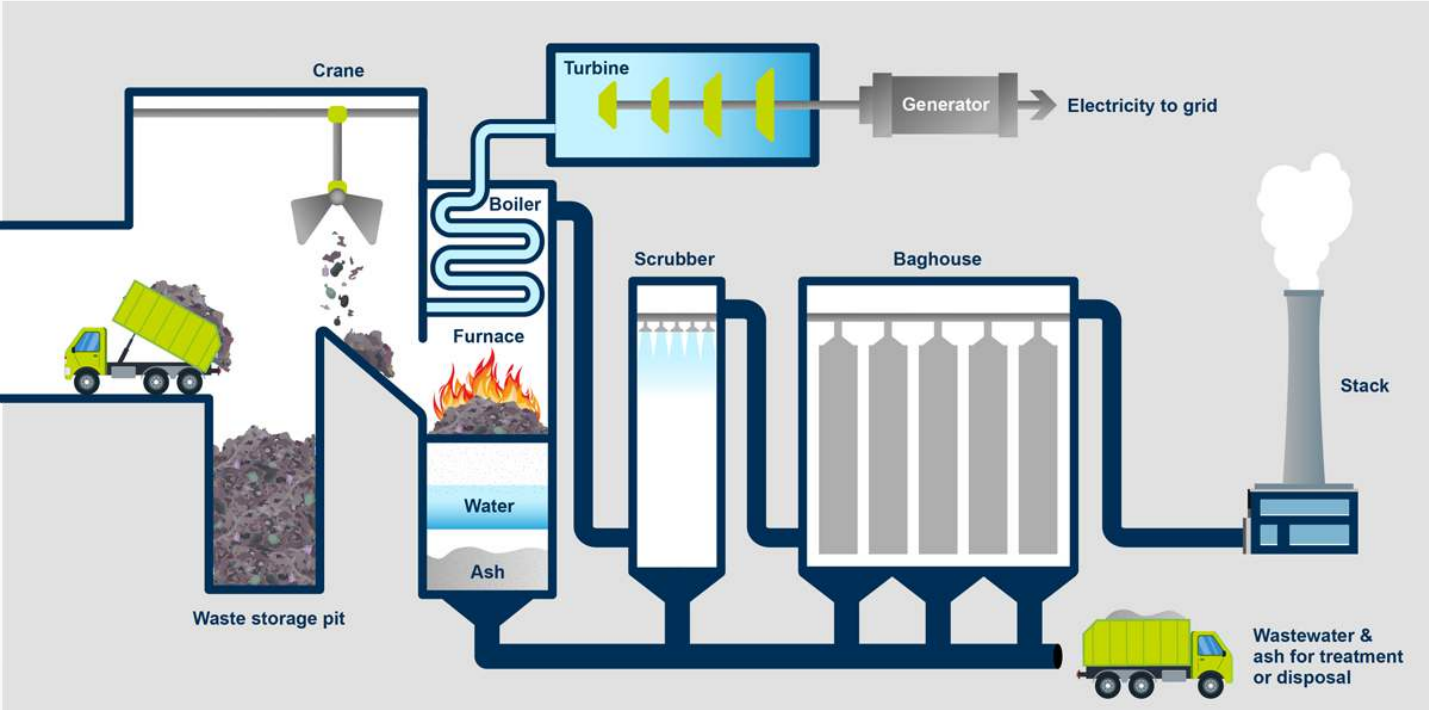
(a) Clean recycled fibres.



(b) Recycled fibres with char residue.

Recycling carbon fibre reinforced polymers for structural applications: technology review and market outlook
S.Pimenta, S.Pinho; waste Management, 2011

Energy recycling

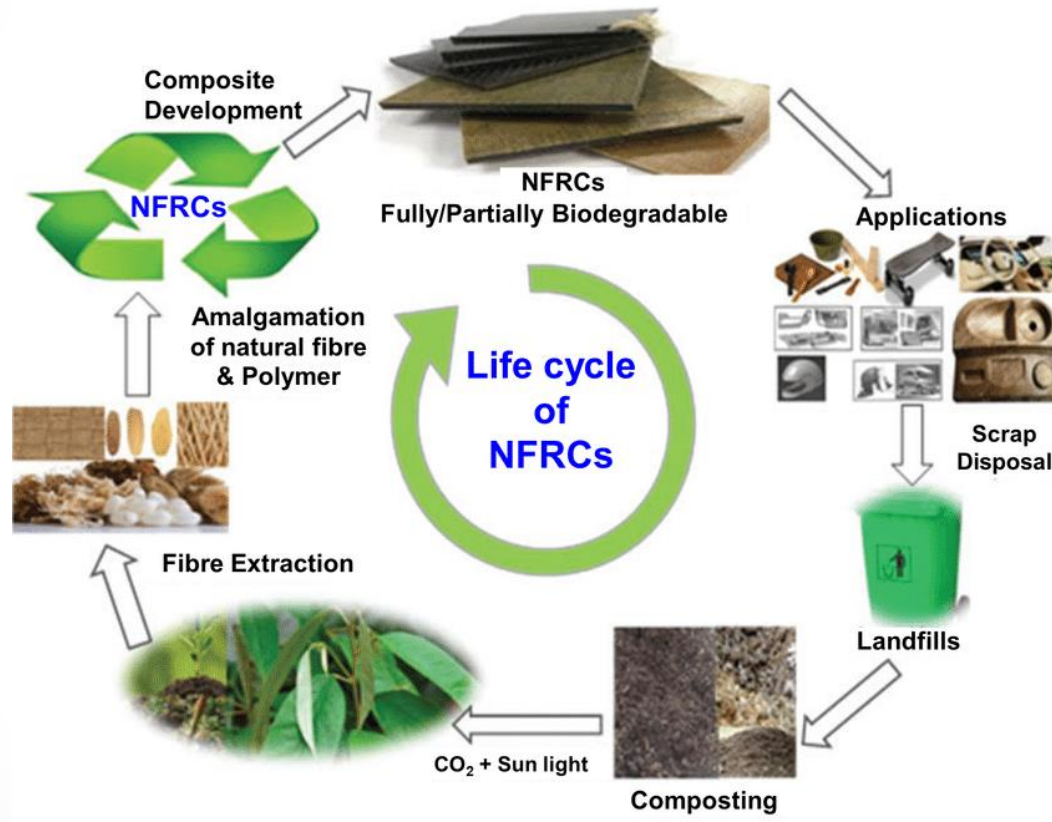


[FutureLearn]

Energy recycling



Biological degradation



[ResearchGate]

Recycling of GFRP into concrete



Recycling technology of epoxy glass fiber and epoxy carbon fiber composites used in aerospace vehicles
R.T. Selvan et al., Journal of composite materials, 2021.

Future developments





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Thank you for listening!

