

Biomass and Co-fired Ash in Novel Binders

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Climate change targets

Move to renewable energy generation

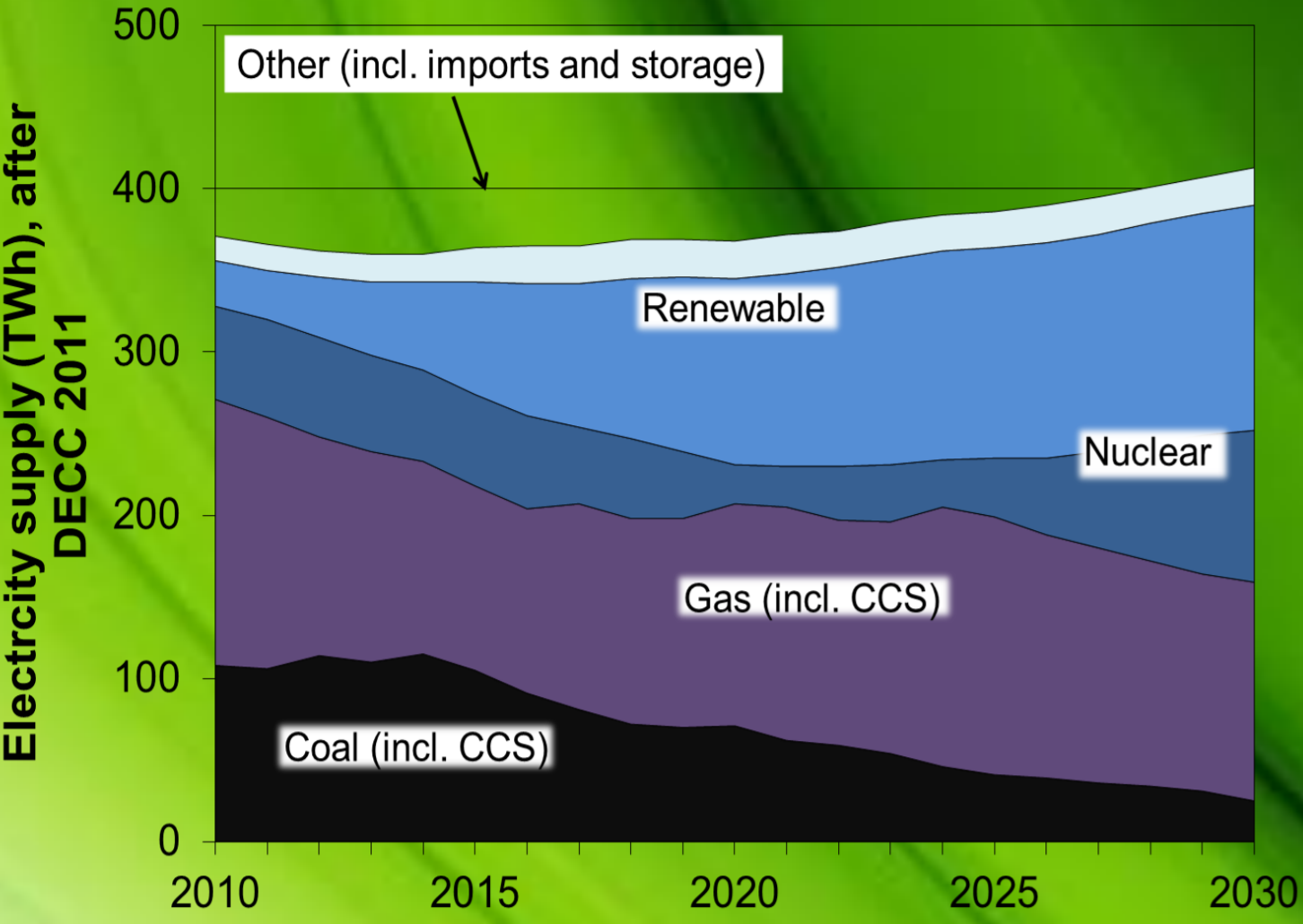
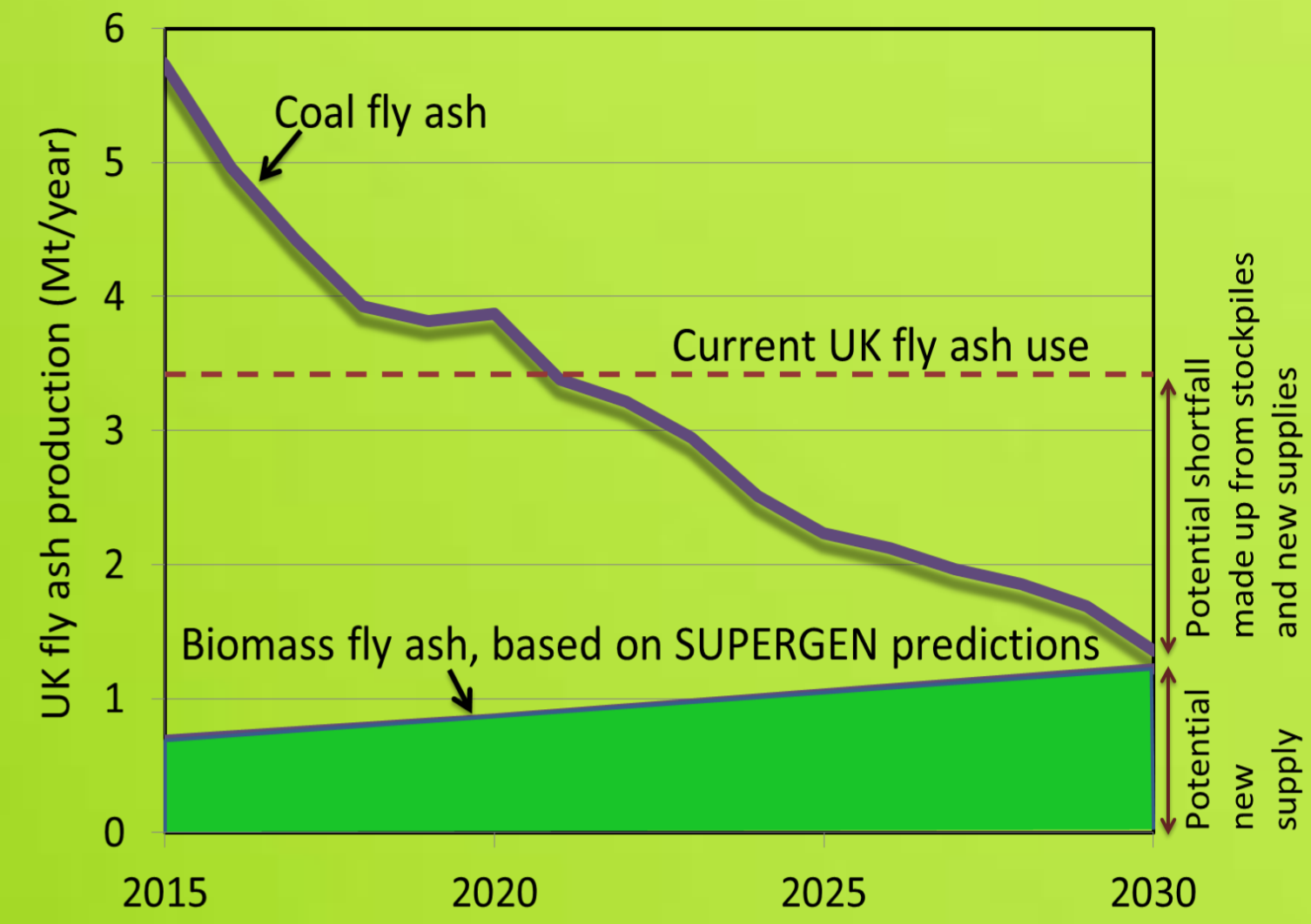
Increase in biomass power and heating

Decrease in coal power generation

Biggest use of coal fly ash is concrete

Biomass ash to increase

Biomass fly ash not allowed in Portland cement based concrete



Novel binders one possible use

Biomass fly ash as a fertiliser?
 Banned in some countries
 Potential ecotoxicity?



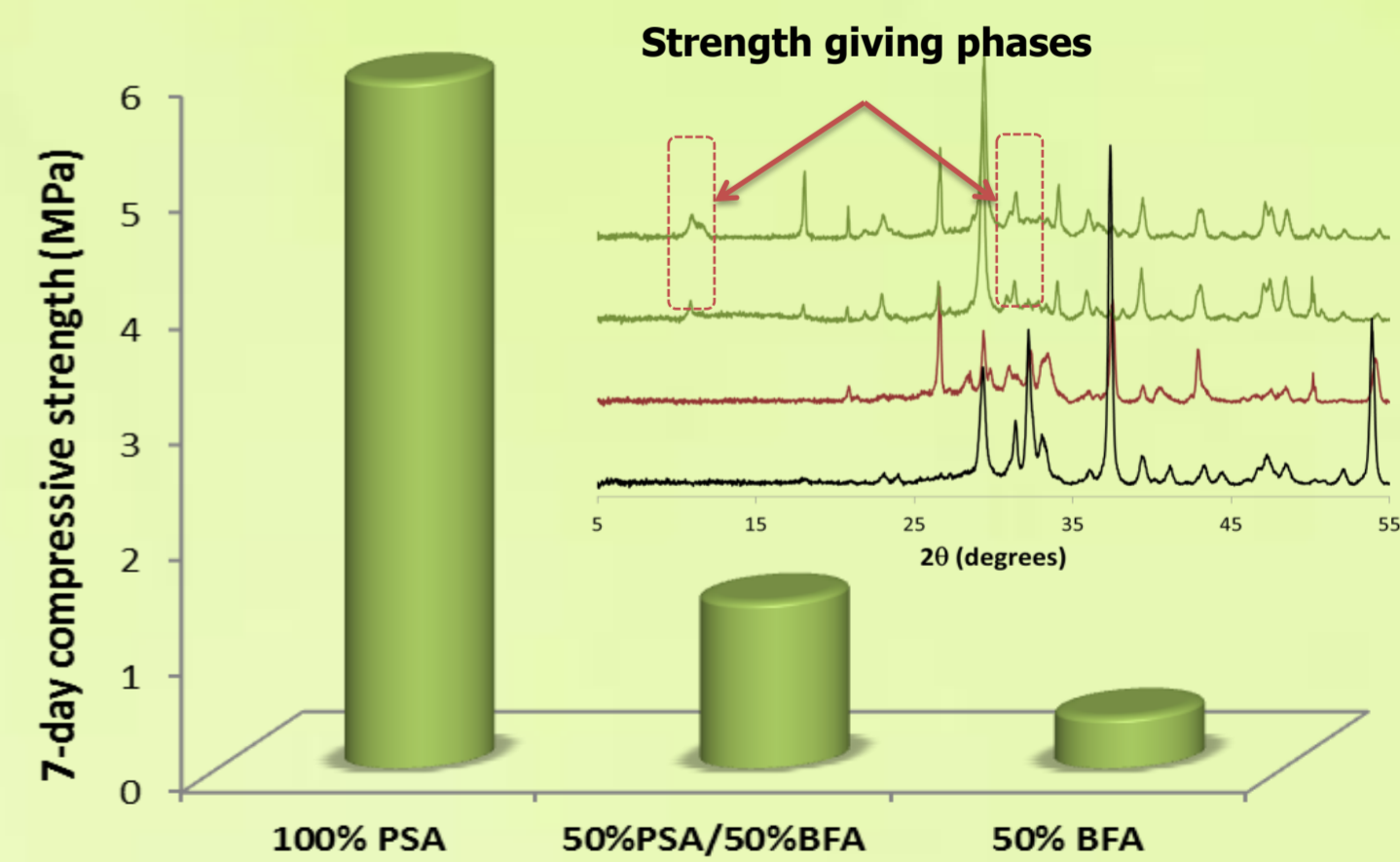
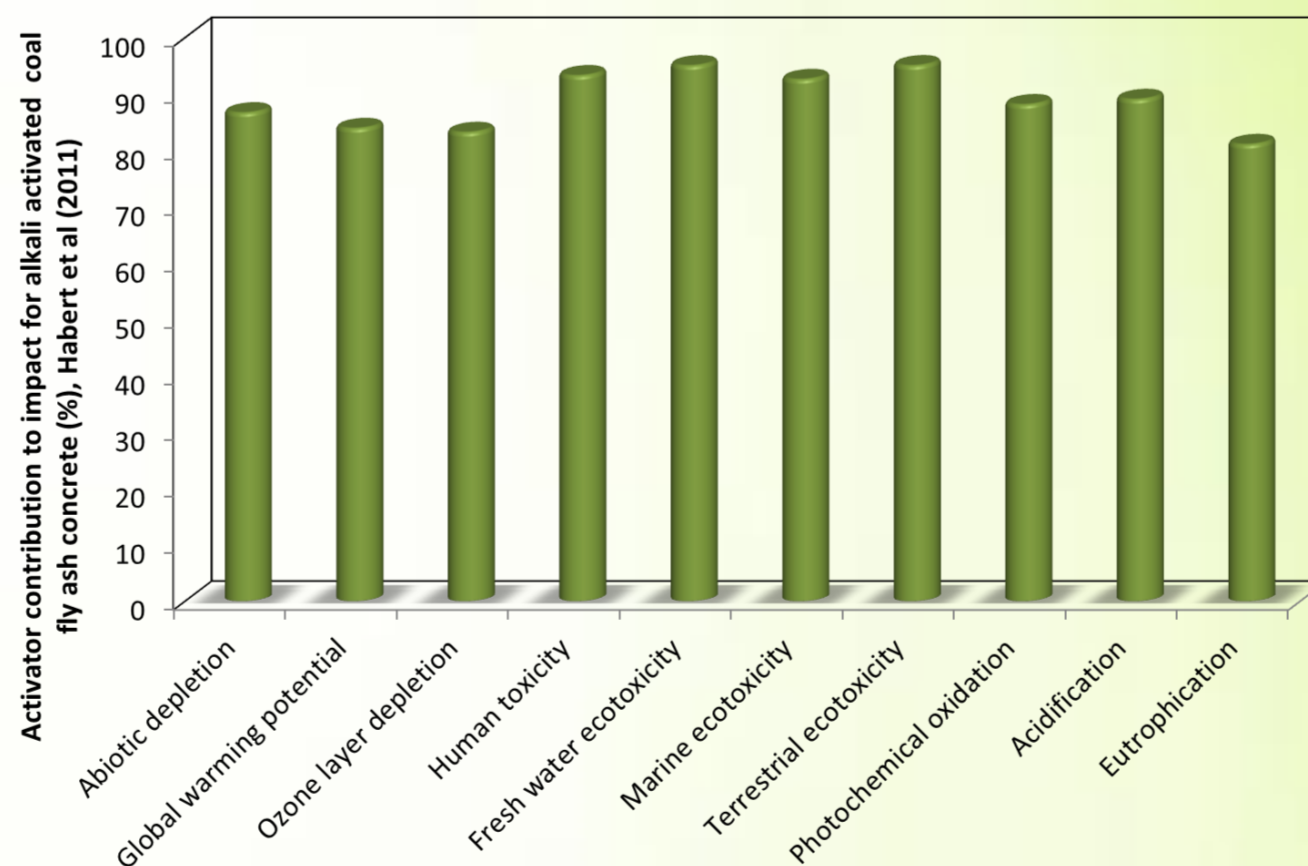
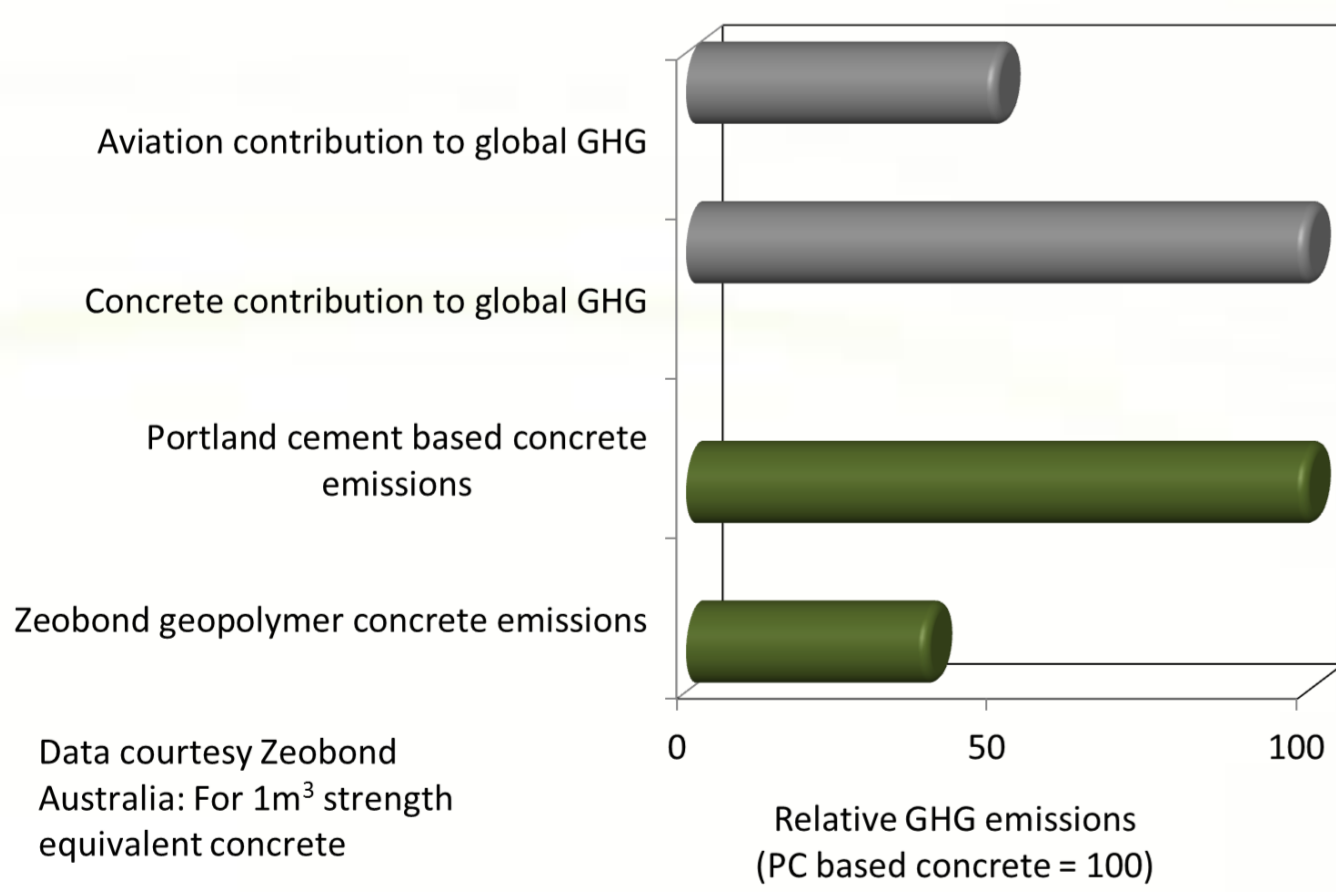
Binders "safe" option
 Something other than Portland cement?
Synergies from ash chemistry
 High CaO and K₂O content

Geopolymer/alkali-activated binders (recommended by IPCC!)

Much lower CO₂ than Portland cement

Major impacts from alkali activators

Biomass fly ash has natural alkalis



Can produce cement replacements

Can reduce footprint

Need to embed *Life Cycle Analysis*

Existing Partners: hips Aylesford Paper Mills, Banah UK, BRE, Drax Power, EPSRC SUPERGEN Bioenergy hub, Marshalls Precast, Stonewood Design, UK Quality Ash Association, Zeobond.