

**Title:** Tough bio-derived and biodegradable wood plastic composites  
**Grant #:** LP160101763  
**Total funding:** \$270,000  
**Period:** 9/12/16 – 8/12/19

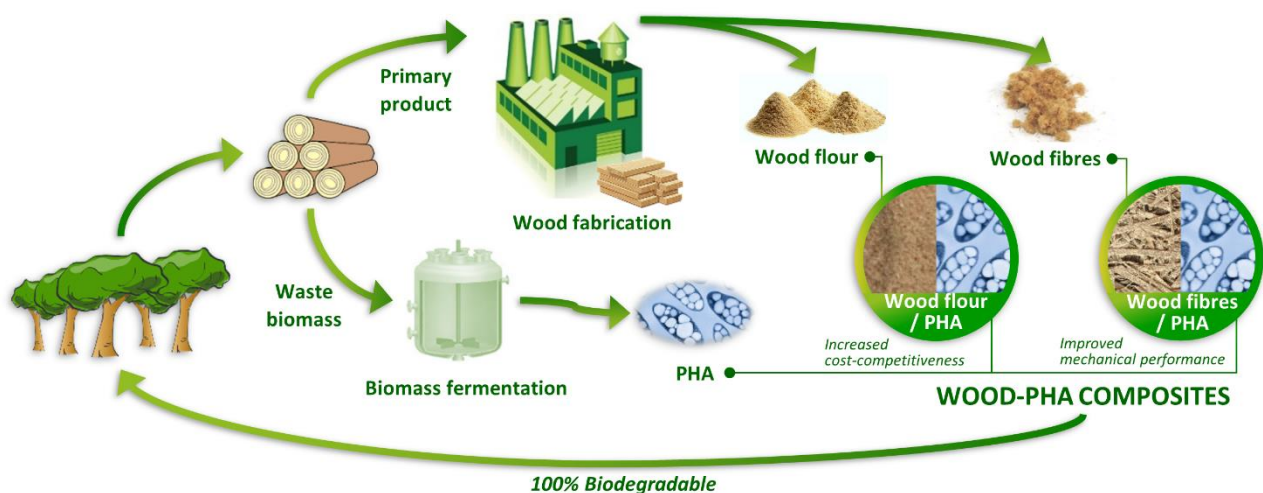
This project is funded by the ARC and Norske Skog Paper Mills (Australia) Limited through ARC Linkage Project.

Wood plastic composites (WPCs) are produced by compounding ground wood (wood flour) and molten polymers, and processed to the desired shape by extrusion or injection moulding. WPCs, with applications such as automotive, packaging, and interior furnishings, are burgeoning internationally. The composites are based on non-biodegradable petroleum derived polymers, but there is emerging research on switching to biopolymers, particularly in light of the drive to a circular economy. We propose they be made using polyhydroxyalkanoates (PHAs) which has unique properties that make it potentially valuable in composite applications, including low viscosity melt flow, good water resistance, lower temperature processing and high crystallinity. Also, it is truly biodegradable and can be produced from carbon-rich waste streams.

This project pioneers the development of tough bio-based and biodegradable WPCs, directly addressing a key end-user demand. This project will lead to new products and markets for the globally challenged Australian forestry industry, satisfying the needs of new and diverse market of Australian manufacturing industries Australia's competitive advantage in biomass-derived product.

In this project, the resources of Norske Skog Paper Mills (Australia), Promiko AB and UQ will combine to foster innovations by:

- Developing a novel tough, bio-based and biodegradable PHA-based wood plastic composites
- Developing technology for efficient processing of tough PHA-based wood composites
- Generating product specifications on the reproducibility, hydrolytic stability and biodegradability of the eco-friendly composites



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