Roger Bateman discusses his Biochair. Photos: Hilary Upton.

The BioChair is designed to be manufactured from byproducts and waste from the forestry industry. The project began in early 2009, a collaboration between Unitec and the Government-owned Crown Research Institute Scion. The idea of combining wood with natural bio-based polymers in the design of an exportable commercial furniture product was suggested by Jeremy Warren, the director of Unitec's School of Product Design. The BioChair is designed to be the ‘naturalness’ of New Zealand with industrial design, creating an original product that can express a new contemporary country brand.

Have you always been interested in chair design? Yes. I have always been interested in chair design since I was a student. I find that chairs are a perfect example of how to combine form and function.

Do you have a favourite piece? I designed my first piece of furniture when I was at school. It was an A level project and I designed library shelving and seating. From then on I went on to Design School in London and studied furniture and Product Design and then a Masters in Furniture Design. A favourite chair? That’s a very difficult question to answer – maybe the Eames Aluminium Group of chairs as these were the first ones I studied in detail and that makes them very special to me.

Does the world need another chair? No – the world needs a better chair, chairs that are not just functional but also aesthetic.

What will the chair be designed for? The BioChair has been designed to provide for a variety of solutions - meeting spots, multipurpose rooms, workstations, guest seating, conference rooms, break-out spaces, and training areas. The design will work in the office and beyond and retail, hospitality, education and recreational environments.

How will the chair be constructed - what does the production process involve? It involves the use of biopolymers and their application to designed products.

Previously, you mentioned that at the end of its life cycle the chair will be reclaimed and burnt to produce energy for the production of new chairs. How did you decide on this approach? It was suggested by Jeremy Warren and the idea immediately made sense to me. Burning is not something I would have thought of. I was considering reusing the plastic and looking at ways of re-processing it. We were also looking at the idea of reusing the biopolymers and their application to designed products.

In a recent talk, the Australian-based designer Alexander Lotenstain spoke of ‘mono-materality’ in design, his desire to use the least number of materials possible. This chair also seems to embody that idea. Is that principle something you kept in mind during the design process? Yes, we were very keen to see a large-scale product designed using a Scion formulated biopolymer and so it was a relationship made in heaven!

My current research into biopolymers and their application to designed products began in early 2008 when I worked with Scion and student designers from the Unitec Bachelor of Product Design on developing design solutions for desktop-sized products. Working with Scion, a range of bio-polymers were identified as being suitable for manufacturing small interior products and small-scale design projects were undertaken with Unitec to utilise these polymers.

In issue 100 of ProDesign, Peter Gilderdale, the head of the Graphic Design department at AUT, predicted that designers and scientists might become better acquainted in the future. This seems to be proof. How did you develop a relationship with Scion? Biopolymers are in the ‘how’ but I predict they will be used to a much greater extent in the coming years. I agree with Peter, and it was with a similar thought in mind I started working with Scion. Business development manager Jeremy Warren was very keen to see a large-scale product designed using a Scion formulated biopolymer, and so it was a relationship made in heaven.

Let’s take it back to basics for the non-scientific amongst us. What’s a biopolymer? A biopolymer is a material that is generated from renewable natural sources, are biodegradable, and not toxic to produce. They can be produced by biological systems or chemically manufactured from biological starting materials such as sugars, starch and natural fats or oils. Bioplastics are replacement plastics for the traditional petroleum-based plastics used daily. Combinations of wood or wood fibres and polymers are increasingly being used to enhance the performance of bioplastics.

Bio-plastics are replacement plastics for the traditional petroleum-based plastics used daily. Combinations of wood or wood fibres and polymers are increasingly being used to enhance the performance of bioplastics.

How was the project for me. The idea was suggested by Jeremy Warren and I was very keen to see a large-scale product designed using a Scion formulated biopolymer. I have used biopolymers in the past but I think they have a much brighter future. I think we are only just beginning to understand the potential of biopolymers.

Scion’s research focuses on understanding the interactions of polymers with wood and pulp fibres, and how these interactions impact on processing and performance.

The BioChair is a collaborative undertaking between Unitec and the Crown Research Institute Scion. It is designed to be manufactured from bio-based polymers, non-toxic polymers generated from natural sources.

Green with four legs

Unitec lecturer Roger Bateman discusses his Biochair. Photos: Hilary Upton.
so that future development will need to be fully tested before any decisions on using a compostable material could be made. The current Biochair material is being tested at Furntech in Tasmania.

Has anyone been making furniture out of biopolymers? There are other designers using biopolymers for furniture. My friend Chris Martin in Stockholm has designed a chair made entirely from a biopolymer and there are other chairs like the ‘Imprint’ chair designed by Johannes Foersom and Peter Hiort-Lorenzen and manufactured by Lammhults. Imprint is a ‘shell’ type chair made in compressed cellulose fibres with the addition of bark or spruce. Strangely the metal underframe is available in chromium plated steel tubing which, considering how toxic the chromium plating process is, is very disappointing.

What would be the best model for distribution, from an environmental point of view?

Good question. There are various models that could be pursued. I have been looking at RTA (flat-pack) and because the chairs are lightweight stacking 3/4 to a box is an option. Alternatively the product could be made close to market but as tooling costs will be high, and material usage in the tooling considerable it makes sense to manufacture in one country. As the Biochair has been designed to use a material formulated in New Zealand and to tell the story of New Zealand design while being as eco-sustainable as possible, I would ideally like for manufacture to be undertaken here.

Coke with that? Around these parts we tend to admire the styling of Emeco’s Navy Chair and interestingly Emeco recently teamed up with Coke to create a variant of the chair made out of 111 recycled plastic bottles (from the company’s South Carolina recycling plant). The chair is made out of rPET (Recycled Polyethylene Terephthalate – recycled plastic bottles), and Emeco developed the proprietary formula with scientists from BASF. The chair’s design includes the original stretcher (structural brace) below the seat, a detail that creates great structural integrity. Replicating the chair required an advanced molding technique. A gas assist process adds internal structure to the chair while minimizing the amount of material required. The chair body is manufactured upside down in a special core island while a robotic function inserts the stretcher into place while the chair is hot.

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