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## ISER Impact Story

# Professor Rachel Burton

School of Agriculture, Food and Wine

## Industrial use of sustainable hemp: food, construction material, fabric



Have you ever wondered exactly how concrete is made? How about your warm winter jumper, or the panels of your car? Have you ever wondered about how much those manufacturing processes contribute to the emission of greenhouse gases? Professor Rachel Burton has – extensively – and she has some big plans that will help revolutionise the manufacturing industry and slash greenhouse gas emissions.

Professor Burton's team is based within the School of Agriculture, Food and Wine at the University of Adelaide, and is part of the ARC Centre of Excellence in Plant Energy Biology. She is an expert plant scientist, with experience spanning fundamental plant cell biology, biofuel development, and the creation of new crops.

Her research also falls under the umbrella of the University of Adelaide's Institute for Sustainability, Energy and Resources (ISER), which has worked to support this breakthrough research by facilitating collaboration and industry engagement.

*"The motivation to achieve carbon-neutral industrial products isn't just about saving the world from climate change, Professor Burton explains that it's also about future-proofing our existing manufacturing industry" - something that ISER is actively supporting.*

Professor Burton's team has honed in on how plants can be used to create sustainable, carbon-neutral industrial products. Because plants naturally absorb carbon from the atmosphere and use it to make energy, this means they balance out the amount of carbon that's released during the manufacturing processes that turn them into useable products. If we can find a way to transition our current manufacturing industry to one that primarily uses sustainable plant material, we could develop a totally carbon-neutral manufacturing ecosystem right here in South Australia.

*"Legislation that enforces carbon-neutrality in manufacturing is going to happen, and most of the industry isn't ready for it. Manufacturers who rely on certain products are going to be caught unawares, and we need to be able to offer them sustainable alternatives very soon."*

Unfortunately, there's a lot of work that needs to be done to change this paradigm. Not just scientific work, but coalition-building between researchers, industry partners, and end-users like builders.

Professor Burton's team is attacking this problem from several angles to relieve bottlenecks in the development of these sustainable products - starting with breeding the elite fit-for-purpose plants that will form the basis of the manufacturing ecosystem. Alongside this, they're establishing new agronomic best practices, and implementing industry-recognised product testing for safety and performance.

They're also focusing on training the next generation of researchers in the sustainability field who will have an innate understanding of the industry and what drives it. Opportunities to complete scientific training with Professor Burton's group will be delivered in close partnership with industry leaders, and will foster exceptional communication skills and a unique ability to work in interdisciplinary teams.

"This interface that we're creating with ISER's support didn't exist before, and I'm really excited to be able to act as the glue between slow-paced research and fast-paced industry, and drive this project forward."

"It's what I've always dreamed of."

## PARTNERING WITH INDUSTRY

"Builders would rather stick to what they know to be compliant and safe, even if it's not produced sustainably, than risk the unknown and uncertified," Professor Burton explains. "Which is completely understandable! It's up to us to work with them to develop sustainable alternatives."

With the industry linkages and guidance that ISER can provide, Professor Burton says they've already made significant headway on many of these challenges.

"We've formed industry partnerships that would never otherwise have happened, connected people who were formerly siloed, and many of them now have access to cutting-edge research that they didn't have before."