



Industrial Hemp: Opportunities for Agriculture and Other Sectors in Ireland

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- In **2022-2023**, **Department for the Economy (DfE)** within the **Northern Ireland Executive** provided funding to **Ulster University** and the **Northern Ireland Advanced Composites and Engineering Centre** (NIACE, now known as the Advanced Manufacturing and Innovation Centre, AMIC) to undertake **3 pivotal 'deep dive'** research projects on opportunities:

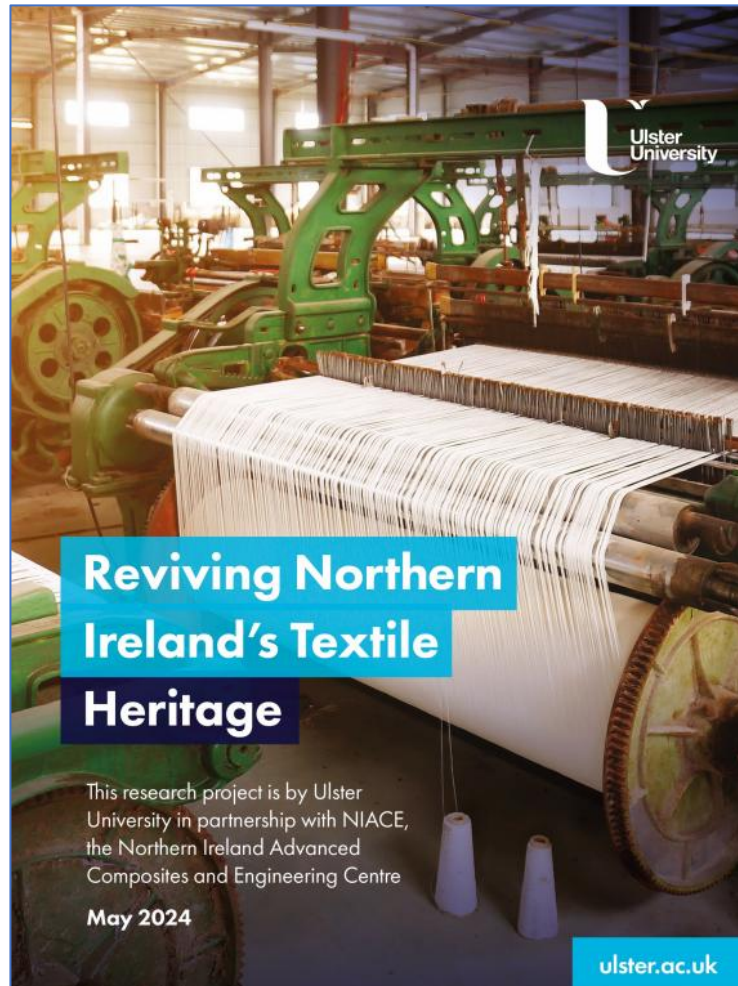
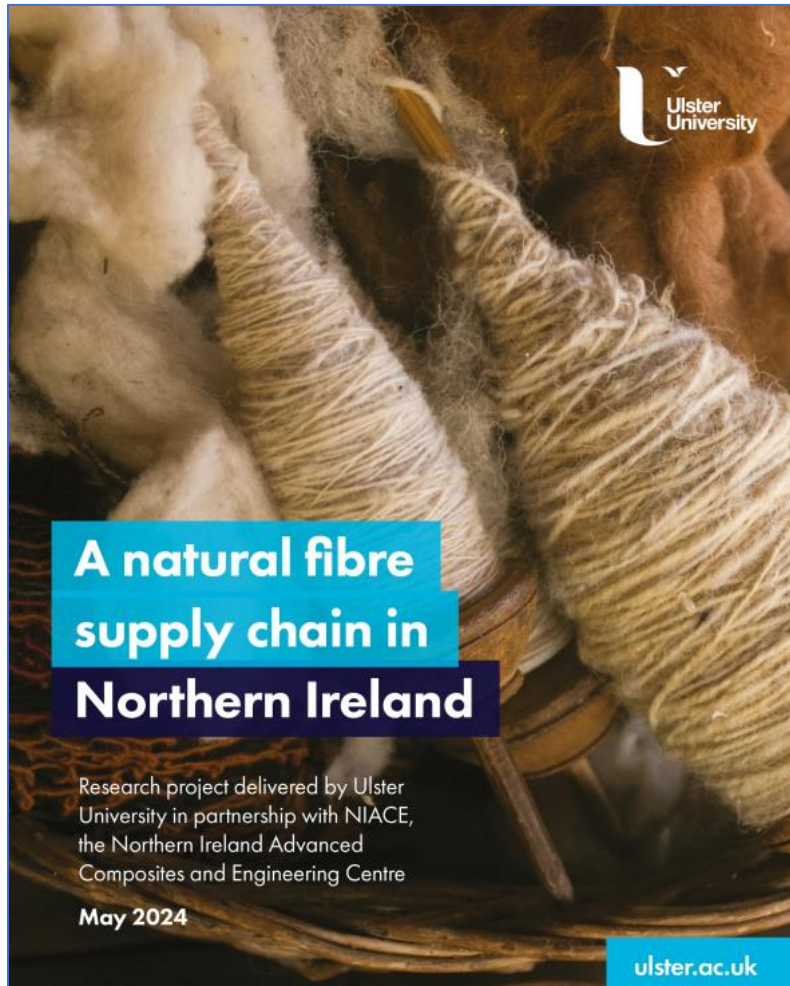
[1] [For a Natural Fibre Supply Chain in Northern Ireland;](#)

[2] [To Revive the Textile Heritage of Northern Ireland](#) and;

[3] [For a Green Fibre Supply Chain in Northern Ireland.](#)

- Overarching goal was to showcase strengths within Northern Ireland to address and overcome market challenges in the areas of **textiles and textile composites**, and doing so, with the **Net Zero by 2050 target** in mind along with economic aspirations of becoming **sustainable, circular** and **green**.

- In **2024**, the research was published in 3 commissioned reports.



Notable Findings

- Markets require **secure supplies of both synthetic and natural fibres** to meet end user demand. For some end users, a confirmed supply of fibre stock is required to successfully tender for business.
- While natural fibres are superior to synthetic fibres in terms of environmental properties and therefore, appealing as end users strive for more sustainable product lines, much R&D is needed to **improve their mechanical properties for use in composites**, especially if they are ever to be considered a worthy alternative to synthetic fibres in high performance composites.
- Additionally, to truly exploit the environmental advantage of **natural fibre textile composites**, much R&D is needed to **develop complementary bioresins/bioplastics**.

Notable Findings

- **Current market trend is for hybrid textiles and textile composites.**
- **Future market trend is anticipated to be Biocomposites (natural fibre textile composites).**
Environment-friendly bioresins are included in this anticipation.
- There are **new market openings** for natural fibre textiles and textile composites in the **sports sector** (sporting clothes and equipment), **wind energy sector** (wind turbine blades and nacelle covers) and **smart textiles** (can respond to environmental or bodily changes, can assist in healing, can collect data for health monitoring, etc.). Here, the high vibrational frequencies of natural fibres can be exploited.
- **There are significant barriers to market for natural-fibre composites.**

Market Barriers

With regards to a secure supply chain for industrial hemp in Northern Ireland/Island of Ireland, the research showcased the following barriers:

- **No known end of life (EOL) strategies** for natural fibres composites where fibre and resin systems can be reclaimed and repurposed.
- Industry highlighted a significant need for **‘demonstrator proof of concepts’** and prototyping capabilities at a component level.
- **Spinning of fibres is essential to achieve a continuous fibre bundle or tow.** As the strength and stiffness of natural fibre is much lower than glass or carbon fibre, to truly compete, the industry strategy intends to replace short glass or carbon fibres with long continuous natural fibre. Cont...

Market Barriers

- Industry highlighted to authors the need to **understand handling of continuous natural fibres**, both in manual layup and fabrication, and in automated preforming processes where the fibre is creel fed such as, in filament winding and weaving processes.
- **Fibre properties need optimised** through research to help fibres better meet their end use specification.
- **Retting process needs optimised** through research to help fibres better meet their end use specification. Cont....



Figure 1. Images from [Kombinat Konopny](#) (Gronowo Górne, Poland) who are growing and processing (to include spinning) industrial-hemp. Kombinat Konopny of recent times (2022-2023) **successfully crowdfunded** to setup onsite spinning facilities for locally grown and processed industrial-hemp and cotton from Greece to produce **high quality spun yarn of 50% industrial hemp/50% cotton**.

Market Barriers

- Typically, **natural fibre seed is be imported**.
- Currently **no known capability to decorticate or spin** industrial-hemp fibres on the Island of Ireland. This limits product range. Additionally, the lack of spinning capabilities for textile fibres **gives locally made textiles higher than necessary carbon footprints**.
- Expertise on manufacturing glass or carbon fibre composites is well established however, the same does not apply for natural fibres especially where high performance is required. For example, **an understanding of natural fibre properties and how they vary over time and changes in growing conditions is required**. Cont...

Market Barriers

- Existing Northern Ireland industrial-hemp growing enterprises are **small-scale**.
- To convince farmers to grow plants for fibre production, they need to understand the **costs involved**; the cost and availability of hiring (or buying) harvesting and decortication equipment, the end use options and the return price for the plant/fibre.
- To convince Government to change policy, incentivise and/or invest, they need to see evidence that industrial hemp is economically viable.
- **In the textile composites market, natural fibre is in competition with relatively inexpensive glass fibre** (glass fibre is ~10 times cheaper than carbon fibre). Cont...

Market Barriers

- Education required to **de-stigmatise** industrial hemp.
- Industrial hemp **licence required reform**.

Acknowledgements

- DfE for their funding and,
- Authors of the 3 Commissioned Reports, as below.

[1] Mclvor, M. J., McIlhagger, AT., Archer, E., Dooher, T., Gault, A., Golbang, A., Ralph, C., Macrae, J., Porter, P., & Quigley, P. (2024).

[A natural fibre supply chain in Northern Ireland.](#)

[2] Archer, E., McIlhagger, AT., Gault, A., Mclvor, M. J., Ralph, C., Golbang, A., Macrae, J., & Porter, P. (2024).

[Reviving Northern Ireland's Textile Heritage.](#)

[3] Mclvor, M. J., Archer, E., Macrae, J., Ralph, C., Golbang, A., Puttaswamy, S., Ward, J., & McIlhagger, AT. (2024).

[A Green Carbon Fibre Opportunity in Northern Ireland.](#)

Please feel free to contact us with any questions or queries:

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