Submission to the Rural and Regional Affairs and Transport References Committee

Inquiry: Opportunities for the Development of a hemp Industry in Australia

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Background

My experience lies in the design and delivery of high-performance, low-carbon buildings using natural materials, including extensive work with hempcrete. Over the last decade, I have been involved in the design and construction of over 20 hempcrete dwellings, many in high bushfire-risk areas, and have developed a deep understanding of the opportunities and challenges involved in using hemp in construction.

I specialise in integrating natural materials within high-performance building envelopes such as Passivhaus design, and am currently conducting research into clay-hemp composite materials with the aim of developing ultra-low-embodied-carbon, high-insulation building products suited to the Australian climate.

In 2024 I presented research on the development of the Australian hemp construction industry at the Australian Industrial Hemp Conference. I am committed to supporting the expansion of a robust Australian hemp industry, particularly through the development of value-added building products, which represent one of the strongest and most immediate market opportunities for hemp.

Response to the Terms of Reference

(a) The potential contribution of an industrial hemp industry to:

(i) Australian farming systems

Hemp has significant potential as a rotational or complementary crop within Australian farming systems. It is fast-growing, can be harvested within 90–120 days, and has comparatively low water and chemical input requirements. It is also known to improve soil structure, reduce weed pressure, and suppress certain soil-borne diseases, making it a useful break crop.

However, to encourage farmers to plant hemp at scale, there must be strong and reliable downstream markets for all parts of the plant—seed, fibre, and hurd. Farmers will not invest in new crop types without certainty of return.

The development of building products using hemp hurd provides a particularly promising and stable market, because hurd represents the bulk of the biomass produced and has fewer competing high-value uses than the seed. Creating demand for hurd in construction will underpin farm-gate value and make hemp a more attractive crop. Parallel markets for seed (food and oil) and high-quality bast fibre (textiles, biocomposites) will further increase returns and minimise waste.

Support for farmer education, trial plantings, and the development of regional processing hubs will be crucial to integrate hemp into Australian agricultural systems.

(ii) Australian manufacturing

One of the main barriers to local production of hemp-based building products is the high upfront capital cost required to establish manufacturing facilities, coupled with the significant cost of testing and certification required to demonstrate compliance with the Australian Building Codes Board's National Construction Code (NCC).

This creates a "chicken-and-egg" problem: investors are hesitant to fund manufacturing facilities without an established market, but markets cannot develop without readily available products.

Short-term support for the selective import of hemp-based building products for demonstration projects would help overcome this barrier by familiarising designers, builders, and regulators with these products. High-profile demonstration buildings can raise awareness, prove feasibility, and build consumer confidence, which in turn attracts investment in local manufacturing.

The building products with the strongest market potential include:

- Hempcrete blocks and prefabricated wall panels – direct replacements for higher-embodied-carbon materials such as Hebel (aerated autoclaved concrete) and clay brick.
- Loose-fill or batt hemp fibre insulation – an alternative to imported wood-fibre batts or high-carbon synthetic insulation products.
- Hemp-based board products – potential replacements for medium-density fibreboard (MDF) and particleboard.

Because the hemp based products offer substantial embodied carbon reductions, they are well-positioned to benefit from the growing push towards net zero buildings and embodied carbon reporting. Demand will only increase as carbon budgets and caps are introduced on buildings.

(iii) The circular economy

Hemp is a fully renewable, biodegradable material, and products made from it can be returned to the soil at end of life. Increasing the use of hemp in the built environment would substantially reduce construction waste going to landfill and allow for more regenerative material flows.

As industry moves towards circular economy models, biobased materials like hemp will be vital. They store carbon during growth, offsetting emissions from other building materials, and they can be composted or recycled rather than landfilled.

Introducing embodied carbon caps on buildings—which is under consideration in several Australian jurisdictions—would dramatically accelerate demand for low-carbon, biobased materials. Hemp building products are well placed to lead this transition.

(iv) The Australian construction industry

From a material performance perspective, hempcrete (a mix of hemp hurd and a lime-based binder) offers many advantages:

- Excellent thermal insulation combined with some thermal mass
- Vapour permeability, enabling moisture regulation
- Fire resistance (non-combustible under AS 3959 bushfire testing)
- Termite and vermin resistance
- Durability and longevity

Despite these benefits, the uptake of hempcrete and other hemp products in construction is limited by two main barriers: cost and knowledge.

Currently, the material cost of hemp hurd and lime binder is higher than conventional materials. However, this is offset by lifecycle performance benefits such as drastically reduced heating and cooling energy demand. As demand increases, economies of scale will lower costs. Development of alternative lower-cost binders—such as my own research into clay-based hempcrete—will further improve affordability and market appeal.

Knowledge gaps are a major barrier. Most Australian builders, trades, and designers have no training in working with hemp materials. This can be addressed through:

- Partnering with major industry organisations such as the Housing Industry Association (HIA), Master Builders Australia, and Building Designers Association of Australia (BDAA) to offer training and CPD courses
- Incorporating hemp construction modules into TAFE building and construction training
- Supporting demonstration projects and apprenticeships to provide hands-on experience

Improving skills and confidence will be key to scaling the use of hemp-based materials in construction.

(v) Australia's economy

Hemp-based building products are now mainstream in Europe and North America. Australia is well placed to become a leader in the Asia-Pacific region, supplying both domestic and export markets.

There is strong interest in neighbouring New Zealand, where I presented on hempcrete in 2024, but the local industry there remains underdeveloped. Australia has the opportunity to capture this regional market, particularly for prefabricated building components.

A thriving hemp construction sector would support regional economic development through:

- Creating new agricultural markets and value chains
- Establishing regional processing and manufacturing facilities
- Creating local jobs in farming, processing, manufacturing, design, and construction
- Enabling export of high-value prefabricated components and IP

(b) Research and development required

Further research is needed in multiple areas to fully harness hemp's potential in construction:

- Lower-carbon binders and mixes: Development of clay- or hybrid-binder hempcrete with lower embodied energy.
- Prefabrication techniques: Establishing cost-effective methods for producing hempcrete panels compatible with Australian building practices and the NCC.
- Spray-applied hempcrete: Widely used in United Kingdom and Europe, this allows fast installation and high-quality results. Supporting Australian trades to train overseas and return as trainers would accelerate adoption.
- Hemp insulation batts: Development of hemp fibre insulation batts to replace imported wood-fibre products and high-carbon synthetic options. This would create a market for the currently low-value short fibre that is a by-product of hurd production.
- Hemp-based board products: Research into using hemp fibre to produce MDF/particleboard alternatives suitable for cabinetry and furniture.

At present, most Australian farmers have a market only for hurd, not for lower-grade fibre, which limits farm returns and creates waste. Bulk fibre insulation batts are a promising way to use this low-grade fibre and would meet a clear gap in the Australian market. Importing such products is not viable because their low density makes transport costly and carbon-intensive, so local production is essential.

(c) Regulations related to production, sale and distribution

Regulatory barriers are one of the largest hurdles to the growth of a hemp building industry. Key areas of support needed include:

- Standards development: Financial support and coordination for the development of an Australian standard for hempcrete and other hemp building products. This work is currently being progressed by industry groups but requires sustained government support to be completed.
- Product testing and certification: Grants to support product manufacturers to fund the laboratory testing and certification needed to demonstrate compliance with the

NCC. This is essential to gain acceptance by building certifiers, insurers, and financiers.

- Harmonised licensing and compliance: Streamlining industrial hemp licensing and regulatory processes across states to facilitate cross-border trade and investment.

These measures will greatly accelerate market adoption and reduce risk for industry participants.

(d) Other related matters

To maximise the potential of the hemp industry, cross-sector collaboration will be essential. Building strong linkages between farmers, processors, manufacturers, researchers, designers, and builders will ensure supply chains develop cohesively.

Government can play a vital role by:

- Supporting pilot projects and regional hubs
- Providing R&D and capital investment grants
- Funding skills development programs
- Coordinating industry roundtables to connect stakeholders

Australia has the natural resources, the skilled workforce, and the emerging industry networks to build a world-class hemp construction industry. With targeted support, hemp can become a cornerstone of our sustainable, circular, and low-carbon built environment, while creating significant regional economic benefits.

Conclusion

There is a strong opportunity for Australia to establish itself as a leader in the production and use of hemp-based building products. Doing so will support our transition to low-carbon construction, create regional jobs, strengthen farming systems, and open export opportunities in the Asia-Pacific.

Strategic government support is now required to overcome the initial barriers of cost, knowledge, and regulation. Targeted investment in R&D, training, certification, and demonstration projects will unlock private investment and enable the industry to scale.

I welcome the Committee's attention to this important issue and would be pleased to provide further information if helpful.

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