Australian Government
Australian Research Council

ADVANCE TIMBERHUB

IH220100016 - ARC Industrial Research Hub to Advance Timber for Australia's Future Built Environment

Capability Statement

31 October 2023 to 30 October 2028

Administered
by

THE UNIVERSITY OF QUEENSLAND
AUSTRALIA

Current 17 June 2024

COALITION ON GREENING CONSTRUCTION WITH SUSTAINABLE WOOD

At the United Nations Climate Change Conference (COP 28), held in Dubai, United Arab Emirates, in Nov/Dec 2023 the Forest and Climate Leaders Partnership Coalition on Greening Construction with Sustainable Wood announced that the Australian Government, with 16 other countries committed to increase the use of timber in the built environment by 2030. The signatory countries endorsed the following statement:

> **Recognizing that wood from sustainably managed forests provides climate solutions within the construction sector, we commit to, by 2030, advancing policies and approaches that support low carbon construction and increase the use of wood from sustainably managed forests in the built environment. Such policies and approaches will result in reduced greenhouse gases (GHG) emissions, and an increase in stored carbon.**

The declaration was signed by: **Commonwealth of Australia**, Canada, Republic of Congo, Republic of Costa Rica, Republic of Fiji, Republic of Finland, Republic of France, Federal Republic of Germany, Republic of Ghana, Japan, Republic of Kenya, Republic of Korea, Kingdom of Norway, Islamic Republic of Pakistan, Kingdom of Sweden, United Kingdom of Great Britain and Northern Ireland, United States of America.

"This is an important strategic direction for the ARC Advance Timber Hub. The Hub is committed to the future development of sustainable timber buildings and the emerging opportunities and innovations that are needed in manufacture, supply, design and construction. The Hub's large research team from 12 Australian Universities and 5 International Universities / Research Institutes, in collaboration with our 30 industry partners, can provide expert assistance in making an increased use of sustainable timber in the built environment a reality."

Professor Keith Crews, Director of the ARC Research Hub to Advance Timber for Australia's Future Built Environment (ARC Advance Timber Hub).

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1. Overview

The ARC Research Hub to Advance Timber for Australia's Future Built Environment (ARC Advance Timber Hub) aims to develop the resources, enablers, and drivers to advance sustainable timber, as a natural resource, to be the material of choice, leading towards a net zero future for Australia's built environment. It intends to support the transformation of Australia's timber and construction sectors by:

- stimulating growth in innovation,
- increasing the uptake of sustainable timber products used in buildings, and
- establishing a roadmap for change.

The expected outcomes will kickstart the change process, supported by growth in advanced manufacturing across the value chain. This should provide significant benefits in stimulating an opportunity for regional development and resource diversification whilst helping Australia's timber and construction sectors transition to a circular and net-zero economy.

The ARC Advance Timber Hub is administered by The University of Queensland's School of Civil Engineering and is funded by our partners, with major funding support from the Australian Government through the Australian Research Council.

INDUSTRY PARTNERS

GOVERNMENT PARTNERS

Queensland Government
NSW Department of Primary Industries

AUSTRALIAN UNIVERSITIES

The University Of Queensland AUSTRALIA
Griffith UNIVERSITY
University of TASMANIA
The University of Melbourne
UTS
University of the Sunshine Coast Australia
The University of SYDNEY
QUT
DEAKIN UNIVERSITY
UNSW SYDNEY
RMIT UNIVERSITY
MONASH University

INTERNATIONAL UNIVERSITIES & RESEARCH INSTITUTES

KTH Vetenskap och Konst
SCION FORESTS | PRODUCTS | INNOVATION
The University of British Columbia
UC University of Canterbury
University of Victoria

2. About the ARC Advance Timber Hub

The ARC Research Hub to Advance Timber for Australia's Future Built Environment (ARC Advance Timber Hub) aims to enable an advanced manufacturing transformation of Australia's timber and construction industries, developing a roadmap to change that unlocks substantial industry and social value.

In order to achieve this aim the Hub leadership have brought together a diverse, cross and multi-disciplinary team of over 90 professionals representing: structural engineering, architecture, building contractors, production and advanced manufacturing of timber based building components and systems, wood and material science, environmental science with specific expertise covering the forestry / timber production sectors and carbon sequestration, psychology, business and policy, economics, socio-economic assessment and macroeconomic modeling.

AIM

The ARC Advance Timber Hub aims to stimulate rapid growth of timber innovation in the ~$80b per year mid-rise building market[1], which could transform Australia's timber processing sector, construction sector, the experience of building occupants, and even the life of the buildings themselves. Large-scale advanced manufacture of innovative engineered wood products (EWP) and innovative use of light-weight timber

[1] https://www.abs.gov.au/statistics/industry/building-and-construction/building-activity-australia/mar-2021

framing solutions provides an opportunity for the Australian timber industry to shift production up the value chain, whilst simultaneously being a critical driver for the building construction sector in Australia to significantly reduce its greenhouse gas emissions by 2030 and to be on the path to net zero by 2050 [2] [3].

The Hub brings together national expertise across the breadth of advanced manufacturing opportunity that EWP innovation makes possible. It will build on successful collaborations that have stimulated new investment in advanced manufacturing efficiency gains[4], and demonstrated substantial opportunity for greater forestry resource utilisation through value chain optimisation[5]. The scope of research will address the full spectrum of engineering and architectural objectives in decision making along the value chain. It will also tackle a billion-dollar opportunity in construction cost savings if the uptake of prefabrication methods grows to international best practice[6] [7], integrating advanced prefabrication research capability and leading skills in autonomous robots for site installation of prefabricated components.

BACKGROUND

The completed (2016 to 2021) *ARC Research Hub for Advanced Solutions to Transform Tall Timber Buildings (ARC Future Timber Hub)* demonstrated the viability of substituting EWP for steel and concrete in mid-rise buildings to drive down construction costs, improve occupant satisfaction and deliver healthy, low-carbon buildings. Extensive stakeholder engagement indicated that a technical research agenda to ***motivate manufacturing investment*** will not be sufficient to realise the opportunity on offer. It will be just as important to ***motivate demand for EWP*** in mid-rise buildings, which requires research to demonstrate the benefits to building clients *and* motivate broader social demand for greater use of timber. The latter is considered necessary to expedite the complex package of policy changes required across the supply chain, from forestry to building design, construction and maintenance.

The ARC Advance Timber Hub will integrate much broader disciplines (engineering and architecture; environmental, behavioural, business and economic sciences) with expertise across the full value chain to overcome systemic constraints to change in the conservative timber and construction sectors. The Hub aims to ***motivate (and support) change*** through proactive, deep engagement that expedites learning across the spectrum of stakeholders involved.

3. Our Vision

The ARC Advance Timber Hub's vision is to transform Australia's timber and construction sectors by stimulating rapid growth in timber innovation and uptake of use of sustainably produced timber and timber products in buildings.

[2] *Australia's emissions projections 2020" – Department of Industry, Science, Energy and Resources, Australian Government*
[3] *White Paper: How timber construction supports the economy and contributes to Net Zero by 2050"; https://timefortimber.org/wpcontent/uploads/2021/05/Time-for-Timber-insurance-industry-white-paper-FINAL.pdf*
[4] *"Impact of continuous drying on key production and performance criteria of engineered wood structural elements" https://www.hyne.com.au/article/264/hyne-s-continuous-drying-kiln-officially-operating*
[5] *"The potential for underutilised timber for the built environment" Mills, H; Baber, K and Gattas, J; Proceedings Pacific Timber Engineering Conference 2019, Brisbane Australia*
[6] *AMGC (2020) Prefab Innovation Hub: Feasibility Study. Australian Manufacturing Growth Centre (AMGC)*
[7] *https://www.storaenso.com/en/products/wood-products/massive-wood-construction/clt*

4. Our Mission & Purpose

The Advance Timber Hub exists to enable an advanced manufacturing transformation of Australia's timber and construction industries through creation of innovative solutions, and developing a roadmap to change, that unlocks substantial value and transformative benefits for industry, society and the environment.

5. Our Research Plan

We will achieve this through our Research Plan, which is informed by stakeholder engagement recommendations, aligning with the need to motivate demand, motivate investment and motivate change. There are eight nodes each with a unifying purpose and coordinated set of methodologies. To implement the research impact of each Node, the research plan will focus the agenda using three themes – *Innovative Solutions, Transformative Benefits and Planning Change.*

RESEARCH THEMES

INNOVATIVE SOLUTIONS for timber products to decrease cost and increase the value of mid-rise buildings. Their potential to support major growth of new advanced manufacturing opportunities will be demonstrated, providing existing businesses and new investors with greater knowledge on combinations of products, manufacturing processes and value-chain configurations that will best serve the needs of building sector clients.

TRANSFORMATIVE BENEFITS of a large-scale shift to the use of innovative timber solutions in the built environment. The potential for this to deliver economic, social, and environmental benefits will be demonstrated, for the timber and construction sectors, and for Australia's regions and economy as a whole.

PLANNING CHANGE in the timber and construction sectors and their surrounding policy environment. Engagement with the broad spectrum of industry and policy stakeholders will go well beyond conventional research outreach. Instead, the engagement will be integral to designing and delivering research over the Hub lifespan, co- producing a roadmap to change through the stakeholder partnership.

RESEARCH NODES

Research Projects are listed on the ARC Advance Timber Hub website under each Research Node.

1. **Performance of Building Components**

The overarching aim of Node 1 is to develop proven product systems that meet the Hub objective of engineering performance of building components. It comprises of six projects to pursue optimum solutions for vibration performance of long-span timber floors, connection systems for extended building life, load bearing wood composites, fire safety of open plan timber compartments, moisture monitoring, assessment and management, and wetting regimes on moisture uptake and connector performance. Skilful and knowledgeable teams of researchers and industry partners, with combined expertise in timber-related structural engineering, fire engineering, materials science and durability analysis, will deliver high-quality project outcomes.

Node and Project Leader: Professor Hong Guan – Griffith University

Project Leaders:
Griffith University - Associate Professor Benoit Gilbert and Associate Professor Hassan Karampour
The University of Queensland - Associate Professor David Lange and Dr Lisa Ottenhaus
Queensland Department of Agriculture and Fisheries - Dr Maryam Shirmohammadi
University of the Sunshine Coast - Professor Tripti Singh

2. Building Performance for Occupants

Node 2 recognises that for timber buildings to be truly sustainable, they need to provide safe, durable, and comfortable environments. With a focus on hygrothermal, bio-hygrothermal, biophilia and acoustics, research activities will intrinsically explore and analyse how we design and make safe, healthy and comfortable environments. The Hygrothermal and bio-hygrothermal research explores how heat and moisture move through the building envelope with the aim of eliminating moisture and risks of human health affecting interstitial and surface mould growth. The biophilia research will explore the psychological benefits that are experienced and expressed by occupants of timber buildings, whilst the acoustics research will explore methods to improve the acoustic resonance of large span timber floor systems. The node leverages the interdisciplinary background of researchers and industry partners in architectural design, human health and behavioural Sciences, and structural engineering.

Node and Project Leader: Dr Mark Dewsbury – University of Tasmania

Project Leaders:
Queensland Department of Agriculture and Fisheries – Dr Chandan Kumar and Adam Faircloth

3. Design for Extended Building Life

Node 3 strives to keep timber buildings and their components in use for longer by developing mid-rise buildings that can be spatially reconfigured, adapted, and deconstructed in a circular economy framework. The node encompasses three research projects focusing on spatial circular design for disassembly and reuse, reversible connections, and modular envelope systems for extended life of new and existing buildings. The node leverages the interdisciplinary background of researchers and industry partners in architectural design, building hygrothermal performance, life cycle analysis (LCA) and structural engineering.

Node and Project Leaders: Dr Paola Leardini and Dr Lisa Ottenhaus - The University of Queensland

Project Leaders:
The University of Sydney – Associate Professor Arianna Brambilla and Dr Eugenia Gasparri

4. Towards A Low-Carbon & Circular Economy

Node 4 examines how the forest-to-built environment value chain can be better integrated with initiatives such as carbon offsets, climate-risk and nature-risk mitigation activities, or nature-based solutions initiatives. The nodes projects propose to (1) review the current state of standards and methods to estimate embodied carbon across the forest-to-built environment value chain, (2) develop a 'integrated' model that can be used to estimate the embodied carbon of materials in various types of buildings and use that to derive case study estimates of optimizing timber use, and (3) assess and develop methods that can be used to estimate 'dynamic environmental impact measures' across the forest-timber-built environment. Agricultural and Natural Resource Economics component in this Node is supported by Dr Tyron Venn – Senior Lecturer in Agriculture Resource Economics from The University of Queensland.

Node and Project Leader: Professor Paul Dargusch – Monash University

Project Leaders:
NSW Department of Primary Industries – Dr Fabiano Ximenes
The University of Queensland – Associate Professor Joe Gattas
University of Melbourne – Dr Robert Crawford

5. Socio-Economic Opportunity

The overriding objective of Node 5 is to deliver all node areas and hub participants with economic modelling services that support the aim of the hub. The node encompasses three research projects focusing on the audit of the industry of current state and potential future of the industry, market opportunity studies in the engineered wood products (EWP) industry, and integration of economic modelling tools to more accurately value sustainable future industries and support decision making through superior and world leading scenario modelling. These projects will develop enhanced capacity in the industry and government to understand the real value of the EWP and future opportunities based on various scenarios. It will also contribute to the emerging academic and applied state of the art on methods to value sustainable future industries.

Node and Project Leader: Dr Cristyn Meath – The University of Queensland

Project Leader:
The University of Queensland – Emeritus Professor John Mangan

6. Manufacturing Innovation

Node 6 drives innovation in timber manufacturing through a focus on prefabrication, manufacturing digitization, and process automation. Three research projects on prefabrication aim to improve fibre efficiency and construction supply by utilizing a wider range of feedstocks and reducing material waste. Two research projects on manufacturing digitization aims to improve fabrication efficiency by developing novel computer vision and augmented reality tools to extend existing quality assurance and semi-automated production processes. Three research projects on process automation investigate how new robotic technologies can increase automation for both offsite and onsite construction, as well as streamline coordination between these stages.

Node and Project Leaders: Associate Professor Joe Gattas – The University of Queensland and Professor Priyan Mendis – University of Melbourne

Project Leaders:
Griffith University – Associate Professor Benoit Gilbert
The University of Queensland – Dr Dan Luo
University of Technology Sydney – Dr Dikai Liu
RMIT University – Dr Nic Bao
University of Melbourne – Dr Tharaka Gunawardena
Queensland University of Technology - Professor Tim Schork

7. Value-Chain Innovation

Node 7 focuses on value chain innovation to enhance resource utilization throughout the forest-to-building timber value chain. Two research projects aim to increase the diversity of timber resources utilised as construction supply, including for example utilisation of low-value wood fibre, hardwood plantation thinnings, and small logs. Two research projects aim to enhance the value-add and visibility of Australian timber products, including through development of new engineered wood products and a web-based material tracking framework for forest-to-building value chain mapping.

Node and Project Leaders: Associate Professor Joe Gattas and Dr Dan Luo – The University of Queensland

Project Leaders:
The University of Queensland – Kim Baber
Department of Agriculture & Fisheries – Dr Rob McGavin and Dr Bill Leggate

8. Interventions for Change

Node 8 aims to investigate the status, influences and support interventions sought of EWP supply chains in Australia. This information will assist each research node to target research and interventions, sourcing critical insights beyond the ARC Advance Timber Hub members. In addition, the Node will provide a unique data set enabling measurement of the impact of the ARC Advance Timber Hub activities and other stakeholder initiatives to support the acceleration of sustainable timber supply chains in Australia.

Node and Project Leader: Dr Cristyn Meath – The University of Queensland

Project Leader: University of Tasmania – Georgia Lindsay

6. Our Values

Our core values inform how we function as a vibrant, healthy, creative culture that promotes and celebrates excellence and diversity, and embrace a well-developed sense of social responsibility, ethics and equity, and a commitment to work together for the success of the Hub.

CODE OF CONDUCT

1. Operate with Integrity and Transparency:
   - Be direct and honest in feedback and discussions.
   - Accept responsibility; each person owns your comments.
   - Maintain appropriate confidentiality.
   - Seek consensus / agreement on what gets communicated and when / how communication happens.
   - Commitment to a "team based" approach to all activities, with clearly defined and transparent processes that define how each team functions and how decisions are made.

2. Create a safe culture, where people are honoured and valued:
   - Openness to listen; seeking first to understand then be understood.
   - Practice inclusivity, acceptance and respect; honour one another.
   - Maintain a safe, "no blame" culture, where each person is honoured, valued, accepts appropriate responsibility, does not "hide mistakes" so that together, we celebrate successes and learn from mistakes.
   - Empower and mentor those we lead.

3. Be courageous, seek wisdom to lead well and pursue excellence:
   - Trust, mutual accountability and commitment to one another, whilst valuing and esteeming the contribution each person has to make.
   - Pursuit of creativity, innovation, excellence and the highest standards of ethical behaviour and professionalism in delivery of services.
   - Lead from a place of vulnerability and personal integrity.

7. Expected Outcomes

The ARC Advance Timber Hub has brought together interdisciplinary experts from industry, government, and academia with expertise in understanding innovative technology solutions, national transformative benefits, and the processes of change. The organisation of Hub scope and teams, across research disciplines, partner expertise, industry and policy stakeholders, is designed to enable the multi-faceted engagement that will be required to deliver on the ARC Advance Timber Hub Objectives.

OBJECTIVE 1

Develop proven product systems that meet the complex mix of performance objectives required to grow and sustain client demand for timber innovation in mid-rise timber buildings.

- new composite and hybrid elements
- timber building performance for occupants.
- performance of timber building components
- circular design principles for repurposing and extending the life of timber buildings.

Objective 1 Context

The majority of Australian midrise performance research has been the narrowly focused on engineering technologies necessary to allay concerns that EWP can effectively comply with serviceability, durability and fire performance requirements. However, rapid market uptake would require not just proof of feasibility in isolated contexts, but also that EWP innovation can deliver on the full spectrum of engineering and architectural performance objectives that drive the decision making of manufacturers, construction clients, developers / building clients and designers. A stronger evidence base is required to demonstrate where that performance is likely to exceed what is possible with conventional alternatives, and the degree to which the opportunities are relevant across the very different resource and climate types across Australia. Furthermore, the stark gap between typical design (50yr) and actual (20-30yr) building service life in Australia introduces a new set of performance criteria for consideration. By reducing reliance on monolithic construction systems, EWPs bring new opportunity for buildings to be operated as transformable assets to leverage benefits in two ways:

1. Controlled recovery of timber components for repurposing or as energy generation feedstock.
2. Even more substantial benefits could be realised if innovative design of removable EWP provides future flexibility to modify buildings as owner/occupant requirements change, thereby extending the service-life, continuing to sequester carbon and reducing the life-cycle costs (LCC – $; carbon footprint) of mid-rise buildings and more generally, Australia's built environment.

OBJECTIVE 2

Demonstrate the social, environmental, and economic benefits of large-scale increases in timber use in the built environment, at both regional and national scales.

- long-term, macro-scale benefits
- value adding for regional development.
- carbon reduction across the life cycle of mid-rise timber buildings – address life-cycle-analysis and greenhouse-gas criteria

Objective 2 Context

While the prospect of broader environmental and socio-economic benefits is well established, there is insufficient analysis on the scale and regional distribution of those impacts in an Australian context. This limits prospects for compelling local policy makers to reduce barriers to the many sectoral changes required (forestry, manufacturing, construction) for rapid growth of EWP manufacturing. For example, while international research clearly establishes that greater use of wood products will bring net reductions in the carbon footprint of the built environment the few Australian studies of large-scale timber adoption are hampered by a lack of transparency on the contentious carbon accounting protocols used for assessing the full life cycle of wood products. Accounting mechanisms for demonstrating positive contributions towards a more circular economy are even less mature. The challenges with confirming macro-economic benefits are similar in nature, requiring systematic scenario analysis using specialised models and sufficient attention to the most relevant regional and sectoral details.

OBJECTIVE 3

Demonstrate that manufacturing innovation across the supply chain creates new value opportunities.

- advanced manufacture of timber components and systems
- digital design tools for prefabrication & construction automation
- high value engineered wood products from low value fibre

OBJECTIVE 4

Demonstrate that connected and innovative value chains can amplify value for all stakeholders.

- tools for product optimisation
- smart manufacture of timber building systems

Objective 3 & 4 Context

While the scope of ARC Future Timber Hub research into timber manufacturing and value chain innovation was limited to some degree, it clearly demonstrated the potential for such analysis to direct how investment might best be targeted. Furthermore, it established important fundamental engineering knowledge, validated product inventory models, and a developed resource evaluation framework that addresses the strongly location-specific elements of any change to timber resource utilisation and manufacturing practices. Translating this into a compelling case for large scale manufacturing investment requires an expanded scope of investigation. Manufacturing advances require further improvements to underlying lamination processes, and to expand the scope downstream to the prefabrication and onsite construction stages. Value- chain modelling needs to extend beyond the small niche of current EWP products and the Class 1 building market that dominates Australian timber flows, incorporating new innovations in product typology, the implications of large-scale growth in the forestry and timber sectors, and better characterisation of post-fabricator value flows under conventional and novel assumptions about building service life. Furthermore, the optimal opportunity to amplify value likely requires co-optimisation of fibre and product allocation across the Class 1 and mid-rise markets.

OBJECTIVE 5

Develop a roadmap to change that is embraced by industry and policy makers.

- policy development
- identify barriers, enablers, and motivator.

OBJECTIVE 6

Incorporate timber innovation into exemplar projects, showcasing the commercial and regulatory feasibility of undertaking the exemplars.

Objective 5 & 6 Context

The complex mix of changes required, spanning multiple sectors, barriers and policy domains, brings the prospect of both complementary and conflicting stakeholder objectives. A thorough understanding of stakeholder constraints, beyond those of just the Partner Organisations, can help steer the technological and system change research towards recommendations that have maximum impact. Early and ongoing engagement with a broad set of stakeholders establishes a platform to identify steps that will motivate change and support change processes across all stakeholders involved in the Hub. Given the conservative nature of the construction sector and its regulatory environment, translation of the research findings into commercial demonstration projects that are "exemplars", also has an important role in motivating change.

8. Research Impact

The Hub's Executive Management Team combines demonstrated experience at managing large, complex interdisciplinary research projects, with expertise in understanding innovative technology solutions, national transformative benefits, and the processes of change. Building and safe-guarding trust with stakeholders is critical, in order for the Team to guide the research agenda to deliver on its six objectives, as listed under Expected Outcomes. Its impact will also be measured more broadly by three defined key success measures:

1. The ARC Advance Timber Hub aims to create strong recognition amongst industry and policy makers, of the benefits available through greatly increased use of innovative timber solutions; such that timber is accepted and seen as the material of choice for mid-rise building construction;

2. The ARC Advance Timber Hub aims to generate confidence for government and prospective investors that the benefits of manufacturing and using innovative timber solutions will be appropriately valued for the direct benefits to construction and building clients and the broader environmental and regional socioeconomic benefits that they deliver; and

3. The ARC Advance Timber Hub aims to provide all stakeholders with confidence that the roadmap to change is clear and tractable, with the design and implementation of showcase construction projects demonstrating the commercial and regulatory feasibility of large-scale use of innovative timber solutions.

RESEARCH IMPACT PATHWAY

The Australian Research Council defines Research Impact as "the contribution that research makes to the economy, society, environment, or culture, beyond the contribution to academic research."

It is imperative that the Hub captures and reports on the impact of our research program throughout the Hub's life and developed the Research Impact Pathway as a framework for this process.

ARC Advance Timber Hub Research Impact Pathway

Inputs	Activities	Outputs	Outcomes	Benefits
• Research income • Staff • Background and industry IP • Infrastructure • Industry in-kind and funding • Additional industry in-kind and funding for new projects	• Research work and training • Outreach and tech transfer • Workshops/conferences and industry engagement events • Facility use • Industry, community and stakeholder engagement	• Publications including E-publications, industry guides, standards and codes • New practice and/or improved process • New IP: Patents and Inventions • Industry briefings • Media	• Commercial products, licences, and revenue • Industry adoption • Upskilling industry • Increased market or market access opportunities • Job creation • Citations • Integration into policy or industry practice	• Economic, health, social, cultural and environmental benefits • Secure and higher quality workforce • Job creation • Increased industry viability • Increased market • Risk reduction in decision making and industry practice

9. Research Translation

The Executive Management Team will ensure a comprehensive education and outreach program is delivered, working with UQ media units and the Hub's Partner Organisations to develop communications material that is well-positioned for a variety of stakeholders, including industry-based magazines, mainstream media and social media forums. A priority will be to ensure that dissemination and promotion of research priorities and findings reaches all key stakeholder groups across the timber, construction and other built environment sectors, policy makers and the wider community. Outreach activities will include media releases and interviews, public lectures, social media channels, and thought-piece forums such as The Conversation.

Quarterly Steering Group meetings and twice-yearly Strategic Planning Days will ensure that Hub researchers come together with relevant PIs and external stakeholders for regular two-way discussion of research priorities and findings. The Executive Management Team will ensure that all students and early career researchers are provided with opportunities for networking and external engagement for communication of Hub activities and outcomes. Industry relevant reports and guidelines will be published either as monographs or through Wood Solutions Technical Design / Construction Guides, also utilising the communication channels of the public-facing Partner Organisations FWPA, EWPAA, Indufor, Responsible Wood and Timber Queensland.

Hub research will be disseminated to the academic community through publication in leading peer-reviewed journals and conferences, subject to any IP constraints. The cross-disciplinary nature of the Hub activities will

be exploited to ensure that publications are targeted at quality journals across each relevant domain and will include industry relevant reports and guidelines published either as monographs or through Wood Solutions Technical Design / Construction Guides.

A major event for communication is the biennial World Conference for Timber Engineering (WCTE 2025), which will be held in Brisbane in June 2025, hosted by UQ, providing a priority opportunity to showcase Hub outputs to a large, international audience.

10. Partnership Model and Collaborations

The ARC Advance Timber Hub's demonstrated partner commitment to collaboration is very high, crucially, there is strong commitment to provide practical support and perspective from stakeholders across the full value chain.

Timber processing is represented by innovators AKD, Hyne Group, Multinail, Peikko, Loggo; with the demand side covering construction (Megawall Australia, Lendlease Construction, Rubner), construction technology (Meta-Mate, CLT Toolbox, Simpson Strong-Tie, Schmid Screws, SIHGA GmbH), design (ARUP, AURECON, Lendlease Digital, Northrop, Robert Bird Group, TTW), architecture (BVN, Tzannes) and fire engineering (Bloom Fire Consulting, Hydrock Consulting, Semper).

Forestry and government stakeholder groups are included (NSW Department of Primary Industries & Queensland Department of Agriculture & Fisheries) along with groups dedicated to delivering regional and timber-system transitions (FWPA, EWPAA, Indufor, Timber Queensland, Responsible Wood).

This is strengthened by our Chief Investigators from 12 Australian Universities:

1. The University of Queensland
2. Griffith University
3. University of Tasmania
4. University of Melbourne
5. University of Technology, Sydney
6. University of the Sunshine Coast
7. The University of Sydney
8. QUT
9. Deakin University
10. UNSW
11. RMIT University
12. Monash University

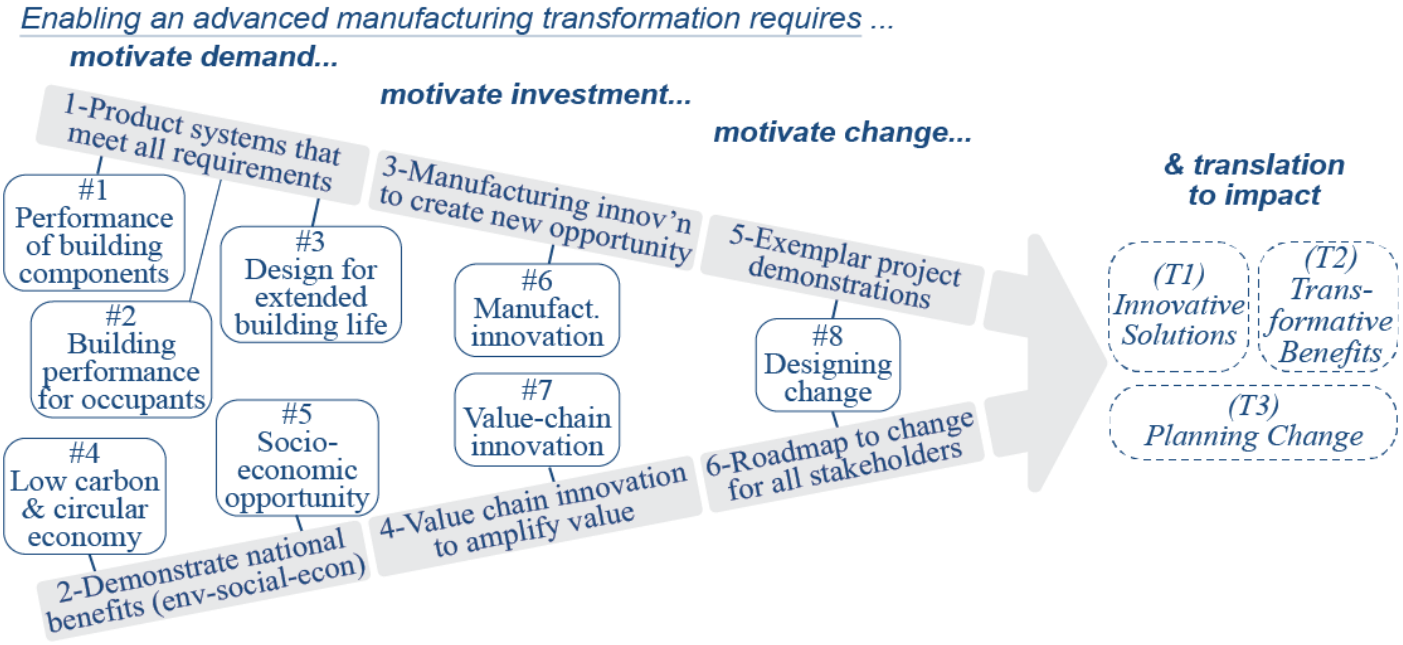
and our Partner Investigators from 5 International Universities / Research Institutes:

1. KTH Royal Institute of Technology
2. Scion
3. The University of British Columbia
4. University of Canterbury
5. University of Victoria

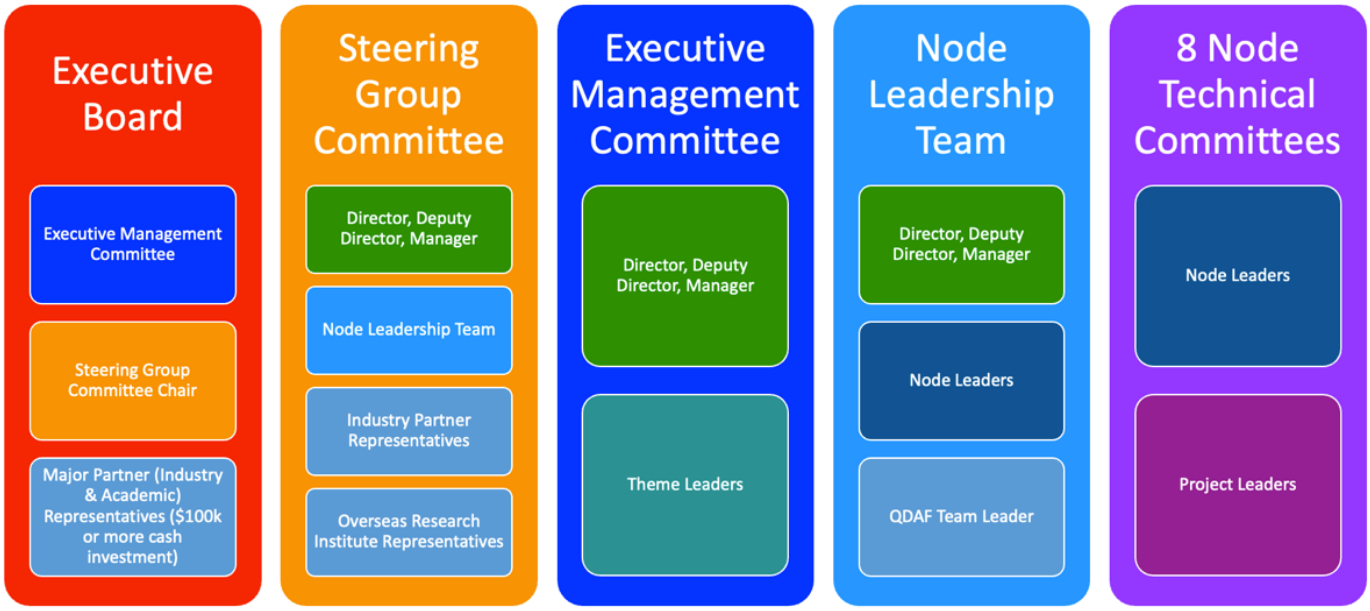
The majority of Partner Organisation involvement builds on already-established research relationships, with further success expected to strengthen these ongoing collaborations.

11.Structure, Roles and Responsibilities

HUB RESEARCH STRUCTURE



HUB GOVERNANCE STRUCTURE



Executive Board

Executive Management Committee

Director / Chair	Professor Keith Crews	**Deputy Director** (Executive Board observer)	A/Prof Paul Dargusch	**Manager** (Executive Board observer)	Kelly Rischmiller
Theme 1 – Innovative Solutions (Executive Board observer)	A/Prof Joe Gattas	**Theme 2 – Transformative Benefits** (Executive Board observer)	Dr Fabiano Ximenes	**Theme 3 – Planning Change** (Executive Board observer)	Dr Cristyn Meath

Steering Group Committee Chair (Executive Board observer)	Toby Hodsdon (Arup)	**Department of Agriculture and Fisheries**	Lynne Turner	**Department of Agriculture and Fisheries**	Dr Tim Smith
AKD Rep	Mateo Gutierrez	**Aurecon Rep**	Ralph Belperio	**EWPAA Rep**	Gavin Matthew
FWPA Rep	Chris Lafferty	**Griffith University Rep**	Professor Hong Guan	**Hyne Rep**	Katie Fowden

The Executive Board will provide on-going executive function of the Hub operations, partner engagement and Research Program.

The purpose of the Executive Board is to:

- provide strategic direction, objectives and priorities of the Hub;
- monitor the implementation of strategy and performance of the Hub;
- oversee the Hub's finances and operation;
- recommend Projects within each Node;
- approve budgets of the Projects;
- establish and maintain a risk register for the Hub;
- act as a forum for keeping parties informed both informally and formally on the progress of the activities of the Hub;
- discuss and manage any issues that arise during the course of the operation of the Hub;
- develop and implement a plan for management of the Research Program;
- conduct an annual review of all Projects at the end of each year during the Term to ensure Objectives are being met;
- ensure an education and outreach program is delivered to ensure dissemination and promotion of research priorities and findings to key stakeholders and the wider community;
- identify suitable research for publication and distribution, develop agreed protocols with regards to confidentiality issues surrounding the collection, use and distribution of any information arising out of the course of the Project and to ensure that any such protocols shall not be in contravention of any applicable laws relating to Confidential Information;

- carry out any functions that may be necessary to ensure the monitoring, management and direction of the Hub in accordance with this Agreement and the Funding Agreement.

Steering Group Committee

The Steering Group Committee will:

- provide Node performance advice to the Executive Board;
- review the Node research project proposals and make recommendations to the Hub Director and the Executive Board on details of specific projects and the allocation of resources across the Nodes and the Research Programs;
- provide technical review of all Hub Publications and approval of all Publications in accordance with the publication guidelines established by the Executive Board;
- act as a forum for keeping all Participating Organisations participating in a Project informed on the progress of the Nodes and any individual Project; and
- ensure there is sufficient transfer of information and expertise across the Nodes required to ensure the overall Hub Objectives are met.

Executive Management Committee

The Executive Management Committee will support the executive function of the Hub and will lead the strategy for communicating and translating research to industry and stakeholders.

The Hub Director, Deputy Director and Manager will provide the daily operational, administrative duties for the Hub to function efficiently.

Node Leadership Team

Performance of Building Components	Professor Hong Guan	**Building Performance for Occupants**	Dr Mark Dewsbury	**Design for Extended Building Life**	Dr Paola Leardini, Dr Lisa Ottenhaus
Manufacturing Innovation	Professor Priyan Mendis, Associate Professor Joe Gattas	**Value-Chain Innovation**	Associate Professor Joe Gattas, Dr Dan Luo	**Towards A Low-Carbon & Circular Economy**	Professor Paul Dargusch
Socio-Economic Opportunity	Dr Cristyn Meath, Emeritus Professor John Mangan	**Interventions for Change**	Dr Cristyn Meath	**Queensland Department of Agriculture & Fisheries – Forest Product Innovations Team Leader**	Dr Bill Leggate

The Node Leadership Team will:

- ensure the operational activities, milestones and KPI's of the Hub are met;
- ensure a comprehensive education and outreach program is delivered; and
- organise opportunities for networking and external engagements for Students and early career researchers.

Node Technical Committees x 8

The Node Technical Committee will:

- manage and report on progress on Projects against agreed KPIs and Milestones;
- develop and propose the Node Research Program;
- participate and contribute to a Hub progress workshop once a year to demonstrate research programs and outputs;
- identify any Project risks and report these to the Hub Director; and
- contribute to the Hub Progress Workshops as required.

12. Main Contacts

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END