



**Advanced Timber Manufacturing Hub**

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## Executive Summary

The Advanced Timber Manufacturing Hub (ATMH) will enable the development of high value products from small diameter regrowth, sourced from thinning of native forest and sustainable harvesting operations where the primary purpose is to produce sawlogs. The ATMH will introduce new markets and technologies that ensure full utilisation of the wood fibre harvested.

The ATMH will provide;

- 126 New jobs;
- \$9m to the regions Gross Regional Product; and
- \$ 58.5m of capital investment.

Indicator	Direct contributions	Indirect contributions	Total contributions
Output	\$24.03 million	\$5.42 million	\$29.46 million
Value add (GRP contribution)	\$6.70 million	\$2.13 million	\$8.83 million
Wages paid	\$9.39 million	\$0.90 million	\$10.29 million
Operating surplus and mixed income	\$1.99 million	\$1.14 million	\$3.14 million
Employment	84 FTE	41 FTE	126 FTE

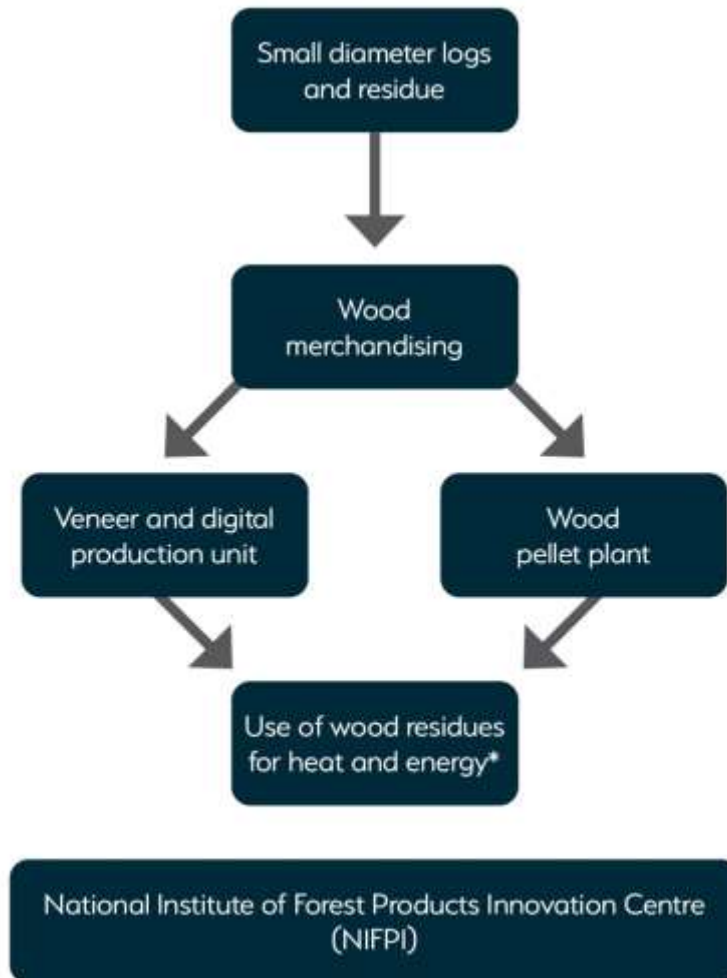
This initiative supports the *Forest Management Plan 2014-2023* (the Forest Management Plan) to ensure healthy forests whilst introducing new technologies and innovation within the forest sector. This includes the use of robotics, new advanced manufacturing systems and a more efficient supply chain.

The ATMH is a common user infrastructure facility that will offer infrastructure to accommodate several wood-related industries. Following the establishment of the initial proponents, the number and mix of additional industries will depend on the commercial feasibility of each.

Each of the proponents is committed to their component of the project and fully understand that for all to succeed there is an interdependence with each other.

For the initial development we have examined two processing opportunities and a research, development and extension initiative. These are:

- A Veneer & Digital Production Unit producing premium hardwood product from residue logs. The technology is suitable for manufacturing of cabinetry, decking and flooring products and will replace imported hardwood;
- The production of wood pellets for use as feedstock for bioenergy plants (including co-firing coal power stations) sold to customers located offsite; and
- A National Institute of Forest Products Innovation Centre (NIFPI), to support ongoing forest and wood product research in WA.



\*Under prefeasibility

A suitable site within the Timber Precinct in Moore Rd Dardanup has been identified. Following detailed assessments, this site has been selected as the most appropriate location for the project. This business plan reflects these changes.

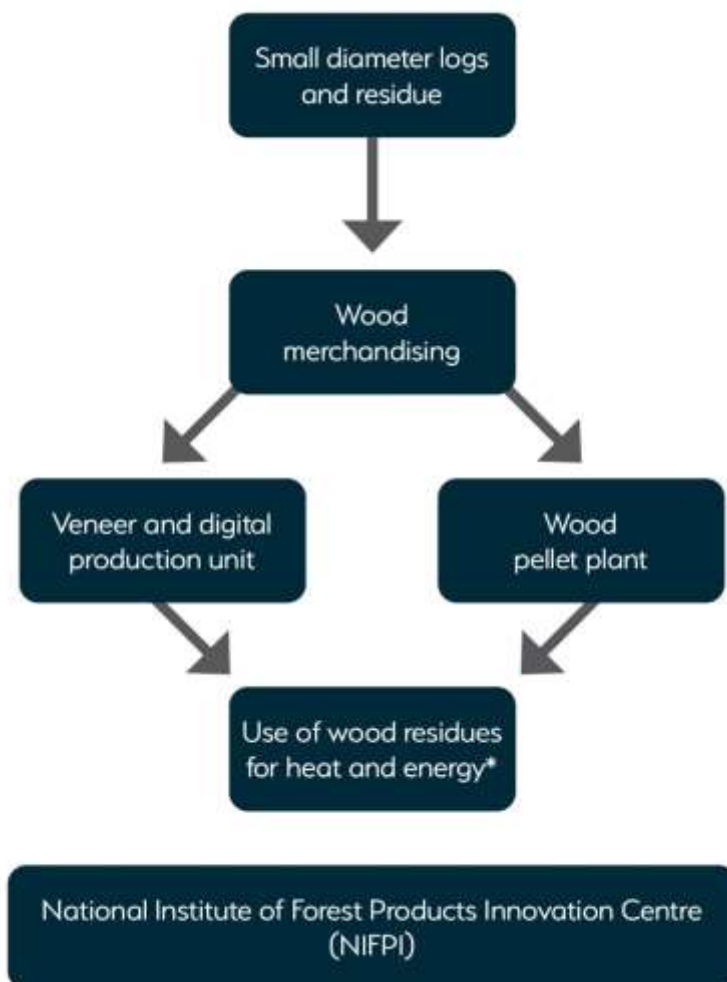
- **Section One – Details of the Project**
  - Outlines the overall project, its impacts on the region’s economy and its ongoing viability
- **Section Two – Details of the Proponents**
  - Provides details of the proponents
- **Section Three – Alignment to Government Policy**
  - Outlines how this project meets government policy
- **Section Four – Site**
  - Details the Dardanup site and outlines the request from government and funding options.
- **Section Five – Response to Specific Issue Raised in Stage Two Offer Letter**
  - Responds to the specific queries raised through the Stage 1 assessment.

### Project Description

The Advanced Timber Manufacturing Hub (ATMH) is a common user infrastructure facility that will accommodate several wood-related industries. Initial processors have been identified and will support the establishment of the facility. The future number and mix of industries will depend on the commercial feasibility of each.

For the purposes of this proposal, we have identified three processing objectives and a research, development and extension initiative.

- A Veneer & Digital Production Unit producing premium hardwood products from residue logs. The technology is suitable for manufacturing of cabinetry, decking and flooring products and will replace imported hardwood;
- The production of wood pellets for use as feedstock for bioenergy plants (including co-firing coal power stations) sold to customers located offsite; and
- A National Institute of Forest Products Innovation Centre (NIFPI), to support ongoing forest and wood product research in WA.



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## Current Proponents

### Forest Products Commission (FPC) – Wood Supply and NIFPI

The FPC is responsible for the sustainable management and development of Western Australia's forest products industry, using plantation, sandalwood and native forest products on land owned or leased by the State.

All native forest operations are undertaken in accordance with the State's Forest Management Plan, which is prepared by the Conservation and Parks Commission and the Department of Biodiversity, Conservation and Attractions. The plan protects all old-growth forest and provides limits on native forest log production. The production limits result from a complex balance of economic benefits with biodiversity, healthy ecosystems, soil and water resources and social and cultural values.

Timber production in native forest only occurs in regrowth forests i.e. forest areas previously subject to timber production. The regeneration and management of these forests has been very successful with many areas harvested multiple times over more than 150 years. In some areas there are now a larger number of stems, which is problematic within the context of a drying climate (declining rainfall). High stocking threatens the forest health in some regrowth areas and management intervention through thinning is required. By utilising the wood fibre produced from thinning it is possible to offset forest management costs.

Forest management is also guided by *The Djarlma Plan for the Western Australian forestry industry*, which is inspired by the Noongar concept of Djarlma, which reflects the interconnected relationship of people with forests and woodlands.

It takes a bold and new approach, focusing on working collaboratively across the industry, moving well beyond 'business as usual'.

The Djarlma Plan provides a strategic framework for long-term regional economic well-being to foster ecologically sustainable development and provide social and environmental benefits. The plan seeks to transform the timber industry, enabling it to pursue new opportunities. It demonstrates the Western Australian forestry industry's commitment to the ecological sustainability and accessibility of the forests. This commitment will result in the development of an innovative industry that generates income and creates jobs for the State in a responsible manner.

The Djarlma Plan is underpinned by four, interdependent strategic priorities that aim to integrate traditional with scientific knowledge. These priorities are:

- *Healthy forests and woodlands* – to underpin the future of the Western Australian forestry industry
- *Wood product and ecosystem values* – to provide the full range of forest and woodland values in support of a sustainable low carbon future.
- *Community benefits* – the community supports, values and benefits from forests and woodlands.
- *Industry for the future* – a technologically-led, competitive, collaborative industry.

Integral to this Plan is recognition of the importance of research to inform evidence-based management initiatives.

The Commonwealth Government established the concept for regional Research, Development & Extension (RD&E nodes), termed National Institute of Forest Product Innovation (NIFPI's), as part of the National Forest Industries Plan (2018). The purpose of the NIFPI's is to undertake nationally significant research according to specific themes. The Western Australian industry is proposing an RD&E theme associated with

- Advanced Manufacturing;
- Bushfire Mitigation; and
- The Bio-economy.

The Commonwealth has confirmed that \$2M has been committed to a Western Australian NIFPI subject to a matching \$2M commitment from the Western Australian State Government.

The NIFPI would collaborate with local Universities and is consistent with the Djarlma Plan objectives.

#### 3RT - Veneer & Digital Production Unit

3RT has developed a unique technology to convert low grade and small diameter hardwood logs such as jarrah, marri and karri logs from regrowth forest into a new hardwood called "Designer Hardwood." The product looks, feels, and has the properties of sawn timber and is 100% natural.

The technology is patent protected and has been developed in partnership with Flinders University and Bosch. The logs are peeled into veneers that are then pressed into a wooden block via a fully automated Digital Production Unit (DPU). The DPU uses advanced robotics & industry 4.0 smarts in a fast, efficient and cost-effective process. At the heart of 3RT's success is their water based 'Nano10' glue.



The technology has been in operation since 2018 at the 3RT Innovation Centre in Adelaide. The innovation centre is currently producing Designer Hardwood, including a benchtop made from jarrah veneers, for a select group of Australian customers such as Bunnings, Kaboodle and Stratco.

The WA project will value-add a forest resource that currently has little commercial value. It will convert annually around 60,000 tons of peeler billets into 14,000m<sup>3</sup> of high value Designer Hardwood. The peeler billets will be cut from longer length logs that also include very low grade timber that is unsuitable for either veneer manufacture or sawn timber production.



### WAPRES - Wood Pellet Plant

Residues from the harvesting operations and from the manufacturing process will be converted to heat and energy products to be used in the emerging bio-economy.

The wood pellet plant converts wood residue into pellets, which is an efficient biofuel and for which there is a commercial market. The proposed feedstock is residue logs that are not suitable for sawlog or veneer manufacture, woodchips and wood waste generated in the veneering process. In total, approximately 104,000 tonnes of wood pellets will be produced.



### Project Background

The opportunity to develop a log merchandising process was identified in the Djarlma Plan as a key initiative to achieve industry objectives including:

- High value recovery;
- Full utilisation of wood fibre; and
- Cost effective supply chains.

Veneer processing was identified as the most prospective option for value recovery from smaller logs.

Initial feasibility studies focused on the production of veneers that can then be manufactured into plywood or traded in international markets. The primary impediment in these initial investigations was the market value of veneers when used to produce a commodity product such as plywood.

The current project started in early 2019 when 3RT approached the FPC and presented its technology for the conversion of small and low grade logs into premium hardwood. 3RT offered the opportunity to produce a veneer-based product that could be differentiated in the market and had a higher value than traditional plywood.

As discussions progressed, 3RT expressed an interest in locating a processing unit in Western Australia. As part of a joint study, the FPC conducted log veneering trials in Malaysia and NSW. This provided intelligence on the suitability of the Western Australian hardwoods for veneer processing and 3RT converted these veneers into products for market testing purposes.

The market response has been very positive for product applications in both indoor and outdoor use, mainly as a replacement for imported Merbau products. Commercial offtake agreements are being negotiated, including with major retailers such as Bunnings, Stratco and Kaboodle.

Concurrently, WAPRES was investigating opportunities associated with an emerging demand for wood pellets for use in new power stations that are being developed to replace coal fired or nuclear generators.

To support the goal of 100% log utilisation, WAPRES was incorporated into the project with 3RT. This concept has been further developed through the SW Timber Hub (SW Hub) as representing a unique collaborative industry initiative of benefit for the region.

The site identified for the project is Moore Rd, Dardanup. This location is already the basis for a Timber Precinct (including Wespine, Laminex, Hexion and Preston Chipping), and was previously flagged as a key initiative of the Bunbury Geographe Growth Plan (BGGP 2017). The proponents have subsequently done site assessments of the Dardanup site.

This work includes:

- Geotechnical Studies
- Western Power – 8MVA connection feasibility assessment
- Additional chipping capacity approval – including environmental managements plans, BAL assessments
- Mill Design – including finalising process flow and mass balance advice
- Heat & Energy system design – including
  - Confirming preferred energy source (option)
  - System design and costing
  - Carbon footprint and compliance (emissions)
- Site works (costing) including
  - Civils – earthworks
  - Buildings
  - Electrical
  - Structural
  - Water & Drainage
  - Fire Services
  - Environmental

### *Project Purpose*

This project will:

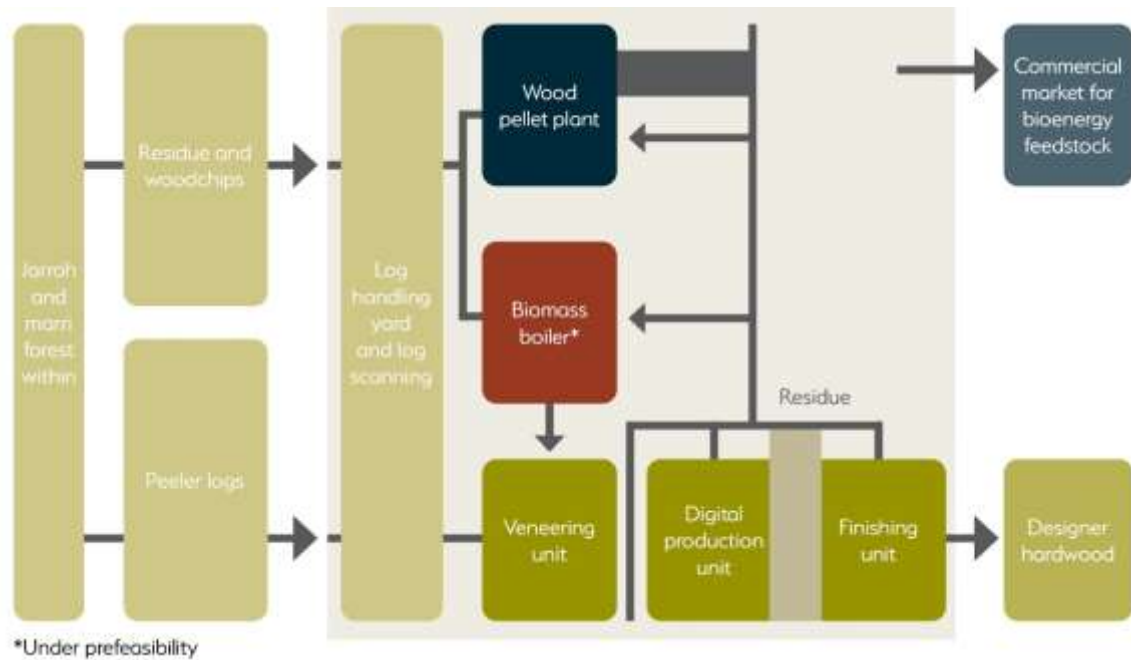
- Develop an advanced manufacturing, veneer-based industry including:
  - Veneer peeling unit;
  - Digital Production Unit for the advanced manufacturing of designer wood; and
  - Finishing unit.
- Facilitate the objectives of the Forest Management Plan and the Djalma Plan by enabling forest thinning and 100% utilisation of all logs harvested through the production of wood pellets for power generation.
- Deliver a local node of the National Institute of Forest Products Innovation (NIFPI), which will undertake nationally significant research into:
  - Advanced manufacturing;
  - Bushfire mitigation; and
  - The bio-economy

This project will deliver new, transformative industries to the WA timber industry. It will provide a blueprint for similar processing centres in other parts of the south west that could be supported as part of the 2024-2033 Forest Management Plan.

### Project Scope and Deliverables

Components of the ATMH are shown in the figure below:

#### ATMH Infrastructure Components



The three main product lines for the facility are as follows:

- Logs delivered by FPC to the ATMH that have the potential to produce veneer billets will be electronically scanned and cut into billets suitable for peeling. The peeler billets will be supplied to the veneer plant and any residue components will be supplied to the wood pellet line.
- *A Veneer Line and Digital Production Unit combined with a Finishing Unit* will produce designer hardwood products from residue peeler logs using a three-step process:
  - a. The peeling billets enter a veneering and drying unit, which trims the ends of the logs and peels them into green veneer sheets, which are then dried to a certain moisture content. The residue created by this veneering process is then utilised in the WAPRES pellet plant.
  - b. The veneers are then passed onto the Digital Production Unit, which converts the veneers into premium hardwood blocks with the same properties as wood that has been produced from much larger and older logs. The entire process takes less than 20 minutes.
  - c. The last step of the process is the preparation of final designer products such as panels, beams and decking boards using a robotic finishing unit. The use of robots allows for a high level of flexibility and therefore provides “mass customisation” solutions at competitive cost.

- A *wood pellet plant* converts wood residue into pellets. Residue enters the pellet plant directly in the form of residue quality logs, woodchips, and wood waste generated in the veneering process

#### Measures of economic contribution

The economic impact assessment examines the beneficial contributions of the increase in total economic activity from the ATMH on the region's economy, as measured by:



*Output* – the gross value of increased economic activity associated with the project.



*Value add (gross regional product or GRP contribution)* – the net value of increased economic activity, consisting of the following components.



*Wage paid* – payments to individuals and/or households in the form of wages.



*Operating surplus and mixed income* – payments to businesses in the form of profits (or rents for using capital).



*Taxes less subsidies* – payments to the Local Government in the form of taxes; and



*Employment* – the total number of employment (full-time equivalent) generated as a result of the increase in total economic activity from the ATMH.