ALBERTA INNOVATES

AGRICULTURE AND ENVIRONMENT

BIOINDUSTRIAL AND CIRCULAR INNOVATION

BIOINDUSTRIAL MATERIALS

Evaluating the potential of using poplar lumber in engineered wood product manufacturing

The proposed project is intended to evaluate the technical viability of producing EWPs using poplar lumber, by developing the appropriate manufacturing technologies and evaluating the mechanical and physical properties of EWPs made with poplar lumber. Currently poplar is an underutilized species in Alberta. The proposed research consists of two phases. The first phase will evaluate the mechanical and physical properties of poplar lumber. The second phase will fabricate prototype EWP using poplar lumber and evaluate the performance of these prototype products. Based on the research results, conclusions will be drawn regarding the economic and technical viability of poplar EWPs. The developed technologies will be transferred to and implemented by existing and new EWP companies in Alberta.

FUNDING DETAILS

RECIPIENT:

Dr. Ying Hei Chui

University of Alberta

PARTNERS:

Alberta Forest Product Association, Western Archrib, Central Forest Products Association, Pinkwood Ltd, University of New

TOTAL BUDGET:

$369,650

AI FUNDING:

$184,850

PROJECT DATES:

Mar 2022 – Aug 2024

PROJECT TRL:

Start: 6

End: 9

APPLICATION

The developed technologies and data will allow the wood industry and prospective producers of engineered wood products (EWP) to implement the research results and produce high value EWPs using poplar lumber which may not otherwise be harvested in Alberta. Although the EWPs covered in this project are limited to wood I-joist, glulam and CLT, once the mechanical and physical properties of poplar lumber have been quantified, a wider range of EWPs is possible. These include nailed laminated timber (NLT), dowel laminated timber (DLT) and glued laminated timber (GLT). All the above EWPs can possibly be made in Alberta, and market opportunities lie initially in North America and eventually internationally.

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PROJECT GOALS

- Evaluate the mechanical properties of poplar lumber
- Evaluate the technical and economic potential of using poplar lumber in traditional and new generation EWPs.

BENEFITS TO ALBERTA

- The technology could establish a new lumber resource for high-value engineered wood products (EWP) in Alberta.
- EWP fabricated using poplar lumber adds over three times more value than poplar dimension lumber, significantly boosting Alberta's economy.
- Consolidating Alberta's position as a major producer of EWP in Canada.

1 Journal Publication,

1 Conference paper under review

2 Master's students

1 Administrative assistant, 2 Research assistants

CURRENT STATUS

AUGUST 2024 – COMPLETE

All lumber samples have been tested to characterize their mechanical properties. Wood I-joists, glulam beams and cross-laminated timber (CLT) panels have been fabricated by industrial and research partners. Testing of wood I-joists and glulam beams is complete. Testing of CLT specimens is completed in August.