

# LANDRY BIOMAT: MASTER BUSINESS PLAN & STRATEGIC BLUEPRINT

**Entity:** Landry Industries Inc. **Blueprint Designation:** Landry BioMat **Location:** New Brunswick, Canada **Effective Date:** July 2026 **Regulatory Framework:** Industrial Hemp Regulations (SOR/98-156), Pulp and Paper Effluent Regulations (SOR/92-269), Canadian Environmental Protection Act (S.C. 1999, c. 33)

## 1. Executive Summary & Core Strategic Vision

- **Venture Identity:** Landry Industries Inc. establishes a vertically integrated, net-carbon-negative industrial manufacturing ecosystem in New Brunswick, replacing legacy resource-extraction models with a 4-month renewable agricultural hemp cycle.
- **Market Positioning:** The blueprint avoids direct commodity competition by anchoring operations in high-margin specialty art papers, ESG-forward publishing, luxury packaging, advanced structural materials, and renewable biofuels.
- **Core Value Proposition:** Producing a complete suite of paper, packaging, building systems, and energy products using a fraction of the land footprint required by traditional softwood forestry, operating with zero-liquid-discharge (ZLD) closed-loop processing.

## 2. Upstream Agricultural Foundation & Sourcing

- **Soil Profile & Location:** Operations are anchored in the Saint John River Valley and Kennebecasis Valley, New Brunswick, utilizing well-drained loamy soils with a target pH of 6.0 to 7.5.
- **Cultivar Selection:** Cultivation relies on approved high-yielding monoecious and dioecious fiber varieties licensed for production in Canada, including Finola, Bialobrzeskie, CFX-2, and NWG 2463.
- **Biomass Distribution & Yields:**
  - Stalk composition yields **20% to 30% outer bast fiber** (high tensile strength) and **70% to 80% inner woody hurds**.
  - Dry straw yields average **8 to 12 tonnes per hectare annually**, delivering 2.0 to 3.2 tonnes of bast fiber and 5.7 to 8.6 tonnes of hurd recovery per hectare.
- **Land Footprint:** A total cultivation footprint of **83,000 to 167,000 hectares** (expandable up to approximately 200,000 hectares / 500,000 acres) completely replaces regional softwood timber output while utilizing only 5% to 9% of traditional timber holdings.
- **Primary Decortication:** Post-harvest stalks undergo 14 to 21 days of natural field retting followed by mechanical decortication via industrial hammer and pin mills (500 to 800 kg/hour per unit) and high-velocity cyclone air classification (≥ 95% bast purity).

## 3. Pulping & Conversion Division (Soda-AQ Process)

- **Chemical Strategy:** Complete rejection of legacy Kraft and sulfur-based pulping methods in favor of the clean Soda-Anthraquinone (Soda-AQ) process.

- **Digestion Parameters:** Continuous vertical pressure vessels operating at **160 °C for 45 to 60 minutes** at 0.8 MPa pressure, utilizing a **15% active alkali charge** (NaOH) and **0.1% w/w anthraquinone (AQ) catalyst**.
- **Pulp Metrics:** Screened pulp yields of **48% to 54%** with Kappa numbers of **12 to 16** and viscosity  $\geq 700 \text{ cm}^3/\text{g}$ .
- **Closed-Loop Recovery:** Multi-stage countercurrent washing and lime-cycle caustic regeneration achieve an **85% to 92% chemical recovery rate** with a zero-liquid-discharge (ZLD) facility footprint.

## 4. Multi-Vector Product Portfolio

- **Specialty Art & Publishing Papers:** Unbleached/natural offset (70 to 100 gsm), bleached bright offset (70 to 90 gsm), and high-speed newsprint (45 to 52 gsm) optimized for fine art printmaking, archival books, and ESG-forward publishing.
- **Luxury Packaging & Kraft Grades:** Unbleached kraft test liners (80 to 150 gsm), bleached specialty food-safe kraft, and compostable PLA/wax-coated box boards for luxury retail packaging.
- **Advanced Materials (Hempoxies & Composites):** Precision-milled hemp carbon morphologies integrated into an engineered epoxy vitrimer matrix to manufacture high-strength, recyclable structural bionanocomposites, alongside engineered Hempwood and presswood particle boards.
- **Building Systems:** High-performance thermal and acoustic insulation panels (Hempcrete blocks) formed by combining purified hurds with natural lime-based binders.
- **Renewable Biofuels & Energy:** Cellulosic ethanol via enzymatic hydrolysis of hemicellulose, biodiesel via hemp seed oil transesterification, and renewable natural gas (RNG) via anaerobic digestion and black liquor co-firing.

## 5. Financial Architecture & Market Projections

- **Capital Expenditure (Capex):** Estimated **\$39M to \$59M** initial investment for an integrated industrial facility over an 18-month build window.
- **Operating Costs (COGS):** Scaled manufacturing COGS of approximately **\$626.80 per tonne** at full operational volume.
- **Market Growth & Opportunity:** Specialty paper markets are projected to grow at a **9.2% CAGR** from \$41.9 billion in 2024 to \$93.3 billion in 2034, with premium paper segments reaching \$344.9 billion.
- **Revenue Projections:** Operating at a conservative blended ASP of **\$1,150 to \$1,787 per tonne** across premium art, publishing, and luxury packaging tiers, achieving gross margins of **45% to 50%** and EBITDA margins of **36% to 41%**, with simple capital payback achieved in 2 to 4 years.

## 6. Regulatory Compliance & Environmental Standards

- **Health Canada Licensing:** Mandatory cultivation and processing licenses under the Industrial Hemp Regulations (SOR/98-156) pursuant to the Cannabis Act, including annual Notice of Cultivation reports and strict THC threshold monitoring below 0.3%.
- **Environmental Effluent Controls:** Full compliance with the Pulp and Paper Effluent

Regulations (SOR/92-269), ensuring zero acute fish lethality (OECD 203 test), BOD5 below 25 milligrams per liter, and TSS below 20 milligrams per liter.

- **Carbon Lifecycle:** Continuous multi-rotation hemp cultivation sequesters net **–500,000 tonnes of CO2 per year**, establishing an immediate, permanent climate-negative operating model that outperforms traditional forest clear-cutting.