Phase II

Textile Transformation Nova Scotia

Part 3 of 3

End-Use Pathways Brief

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October 2026

NACTR

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Textile Transformation Nova Scotia (TTNS) Phase II

Textile Waste Characterization Study, Donation Etiquette Analysis, & End-Use Pathways Brief

Prepared for:

The National Association for Charitable Textile Recycling (NACTR)

Prepared by:

EnsembleCo Consulting

In collaboration with:

The University of Alberta, Department of Human Ecology,

and the Salvation Army Thrift Store

This project was undertaken with the financial support of:
Ce projet a été réalisé avec l'appui financier de :

Environment and Climate Change Canada | Environnement et Changement climatique Canada

Funded by:

Environment and Climate Change Canada (ECCC),

Divert NS,

Greenspring BioInnovation Hub,

and Mitacs

With community partner:

Halifax Regional Municipality (HRM)

Acknowledgements

The project team gratefully acknowledges the contributions of our sorting staff: Brigid, Chris, Gloria, Johanna, Mel, Kalliope, Michelle, and Shawn. Thank you to Ryan and the staff of the Salvation Army Distribution and Recycling Centre for their support throughout data collection. Extending gratitude to Tonny, Sasha, Joel, and Royden for their ongoing support in finalizing this work. Finally, thank you to Hailey for the design of the final product.

Report Authorship

This volume brings together three deliverable reports plus the master document prepared under TTNS Phase II. Authorship, contributions, and reviewers for each report are listed below.

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2	Donation Etiquette Analysis	Charlotte Genge, Dr. John Fiset	Dr. Rachel McQueen, Claire Theaker-Brown, Tonny Colyn, Sasha Barnard
3	End-Use Pathways Brief	Charlotte Genge	Dr. John Fiset, Tonny Colyn, Sasha Barnard

Suggested Citations

Readers citing this volume as a whole may use the following reference:

EnsembleCo Consulting. (2026). Textile Transformation Nova Scotia (TTNS) Phase II: Textile waste characterization, donation etiquette analysis & end-use pathways brief. Prepared for National Association for Charitable Textile Recycling.

Readers citing an individual report should use the corresponding reference below:

Genge, C., Theaker-Brown, C., & Fiset, J. (2026). Waste characterization study. In Textile Transformation Nova Scotia (TTNS) Phase II. Prepared for National Association for Charitable Textile Recycling.

Genge, C., & Fiset, J. (2026). Donation etiquette analysis. In Textile Transformation Nova Scotia (TTNS) Phase II. Prepared for National Association for Charitable Textile Recycling.

Genge, C. (2026). End-use pathways brief. In Textile Transformation Nova Scotia (TTNS) Phase II. Prepared for National Association for Charitable Textile Recycling.

This report is one of three integrated deliverables produced through **TTNS Phase II**. Together, the reports examine Nova Scotia's textile system from material, behavioural, and market perspectives. The overall project context and relationship among the reports are presented in the **TTNS Phase II Master Report**. The present **End-Use Pathways Brief** focuses specifically on identifying investment opportunities capable of retaining greater value from Nova Scotia's post-consumer textile stream.

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0.0 Executive Summary

Nova Scotia has sufficient textile volume to support a circular economy, but currently lacks the infrastructure needed to realize its full value. As downstream export markets grow increasingly unstable, charitable thrift organizations are accumulating larger volumes of surplus textiles while facing rising disposal costs and fewer recovery options, creating both an urgent challenge and a significant economic opportunity.

This report evaluates the end-use pathways best able to retain value from Nova Scotia's post-consumer textile stream, drawing on the **TTNS Phase II Waste Characterization Study** and **Donation Etiquette Analysis**, interviews with 27 industry stakeholders, and relevant research literature. The objective is to identify investments capable of reducing landfill disposal while creating green jobs and strengthening Nova Scotia's emerging circular economy.

Why this matters

No single recycling technology can manage Nova Scotia's textile stream. Different materials (e.g., cotton, polyester) require different recovery pathways, and all of them depend on consistent sorting, feedstock preparation, and stable end markets to function.

The greatest current constraints are therefore the lack of coordinated infrastructure to prepare recyclable materials for downstream users and the limited development of viable end markets.

Key findings

The analysis identifies a portfolio of complementary opportunities rather than a single solution:

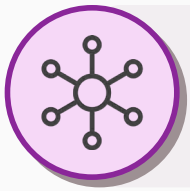
Reuse and Sorting Hub. The most immediate investment priority is **a centralized facility that could aggregate surplus textiles** from thrift retailers across the province, extend the life of wearable garments through outlet and pay-by-the-pound retail, sort remaining materials into consistent feedstock for downstream markets, and leverage economies of scale to negotiate more favourable terms with buyers and processing partners.

Denim recovery and insulation manufacturing. The strongest manufacturing opportunity is a **staged pathway beginning with pilot-scale denim shred production for existing manufacturers**, before progressing toward in-province insulation manufacturing; a confirmed buyer of Canadian-sourced recycled denim insulation already exists.

A broader pathway portfolio. Industrial wiping cloths, technology-enabled fibre sorting, nonwoven manufacturing, mechanical and chemical textile-to-textile recycling, environmental applications, and engineered fuels round out the opportunity set, though nearly all depend on the **sorting infrastructure and coordinated data** described above.

Recommendations

The report identifies **market-level ("MKT") priorities** for strengthening Nova Scotia's textile recovery system. The following recommendations are drawn from the full analysis; codes in brackets (e.g., MKT-1) correspond to the numbered recommendations in the report:



Establish a provincial Reuse and Sorting Hub as the first-priority investment. (MKT-1)



Launch a staged denim-to-insulation R&D initiative and pilot, supported by confirmed market demand. (MKT-2)



Commission a provincial textile capacity and economic baseline study to support future investment decisions. (MKT-3)



Introduce a green procurement policy that creates reliable domestic demand for recycled textile content. (MKT-4)



Establish a textile value chain coordination body to set common grading standards, feedstock specifications, and matchmaking between producers and processors. (MKT-5)



Advocate for and prepare for a mandatory provincial textile stewardship program, building the data and infrastructure ahead of a future EPR framework. (MKT-6)

Taken together, these investments provide a practical roadmap for transforming Nova Scotia's growing textile surplus from a disposal problem into a source of **employment, manufacturing**, and **circular economic development**.

1.0 Introduction

Nova Scotia's textile recovery system is entering a period of transition. Interviews conducted throughout **TTNS Phase II** consistently identified growing instability within downstream reuse and export markets, leaving charitable organizations with increasing volumes of surplus textiles, rising disposal costs, and fewer viable recovery options. These developments reinforce the need to expand domestic reuse, recycling, and manufacturing capacity.

Similar transitions are occurring internationally, as governments and industry increasingly invest in domestic textile circularity through Extended Producer Responsibility (EPR), recycled-content requirements, improved sorting infrastructure, and new recycling technologies. These examples demonstrate that strengthening domestic textile systems is becoming an international priority rather than an isolated provincial challenge.

The central question that this report seeks to answer is:

Where should Nova Scotia invest to maximize textile landfill diversion, create green jobs, and establish the foundation of a circular textile system?

To address this question, the brief draws on findings from the **TTNS Phase II Waste Characterization Study** and **Donation Etiquette Analysis**, alongside interviews with industry leaders and relevant secondary literature. The resulting analysis is intended to support policymakers, industry stakeholders, municipalities, charities, textile collectors and retailers, researchers, and entrepreneurs seeking to contribute to textile circularity solutions in Nova Scotia.

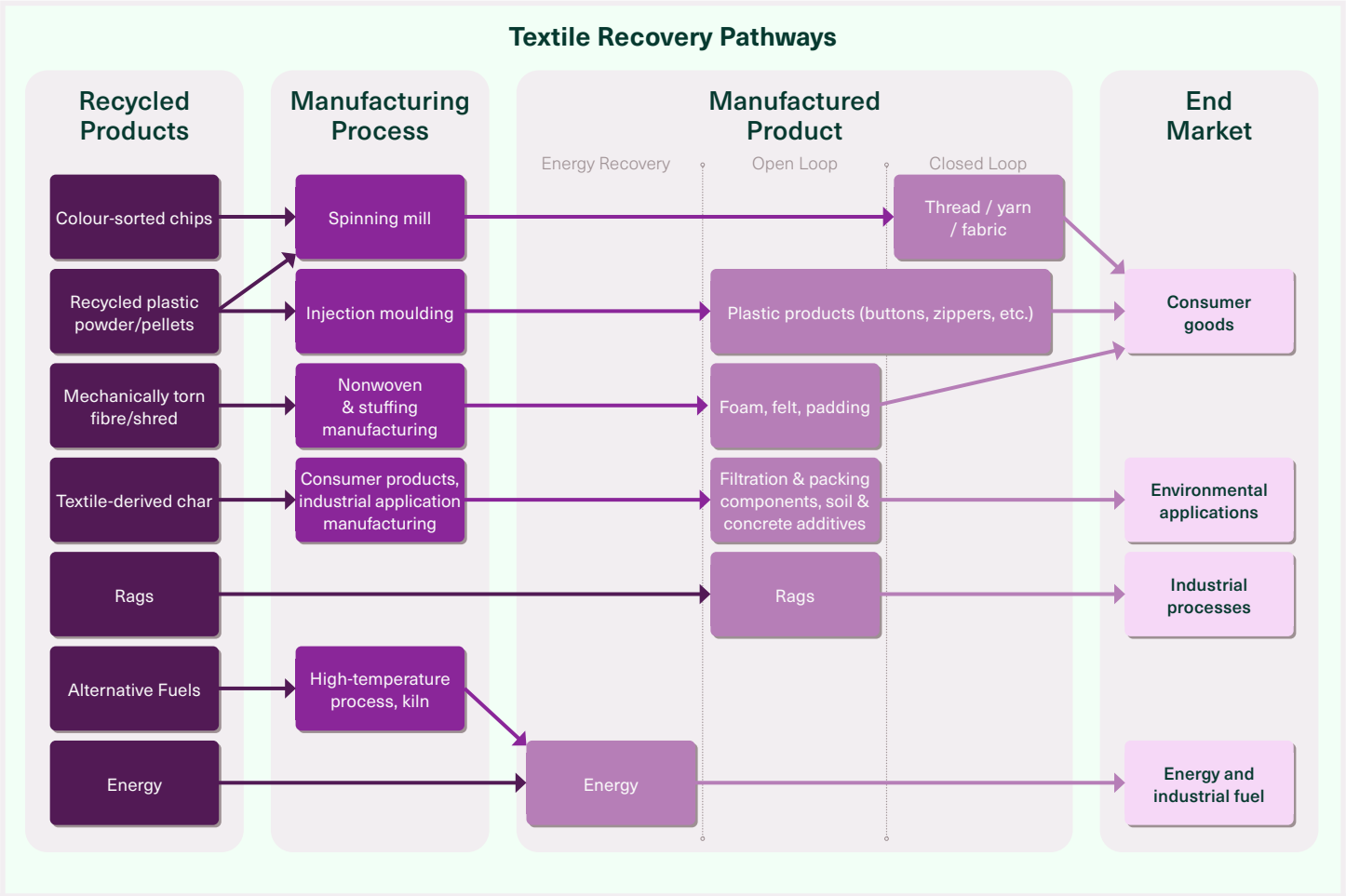


Figure 1: Existing global end-use markets for recycled products derived from post-consumer textiles. Adapted from *Heinrich et al., 2026.*

1.1 Existing Market Opportunities

There are a number of existing markets in Canada for products and commodities utilizing processed end-of-life textiles. These include consumer goods (textiles, nonwoven products like padding and felt), environmental applications (water filtration, packaging, soil amendments) *(Fashion Takes Action, n.d.)*, energy and industrial fuel (alternative fuels for industrial applications, waste-to-energy), and industrial processes (rags).

These markets are supplied with end-of-life textiles via three main pathways: closed-loop pathways, open-loop pathways, and energy recovery pathways. Closed-loop pathways keep materials within the textile value chain, while open-loop pathways direct materials to other markets *(Heinrich et al., 2026)*. Energy recovery pathways are used when materials cannot be used in higher-value recycling.

Figure 1 on the previous page shows existing global end-use markets for recycled products derived from end-of-life post-consumer textiles. **Figure 2** shows textile recovery pathway types: closed-loop, open-loop, and energy recovery.

Although publicly available data remain limited, a small share of post-consumer textiles in Nova Scotia is recycled domestically into industrial wiping rags *(Acadian Wipers, n.d.)*, while some exported material is reportedly recycled overseas, although its final use is not clearly captured in available data *(Hussain et al., 2025; Shah, 2026)*. Most textiles appear to be disposed of, with estimates suggesting that between 460,000 and 1 million tonnes enter Canadian landfills each year *(Cheminfo Services, 2022; Weber et al., 2023)*. Given the volume and diversity of these materials, no single pathway can manage the entire waste stream. A portfolio of complementary solutions will be required, with each pathway serving a distinct role based on material characteristics, available infrastructure, and market demand *(Heinrich et al., 2026; Walsh et al., 2026)*.

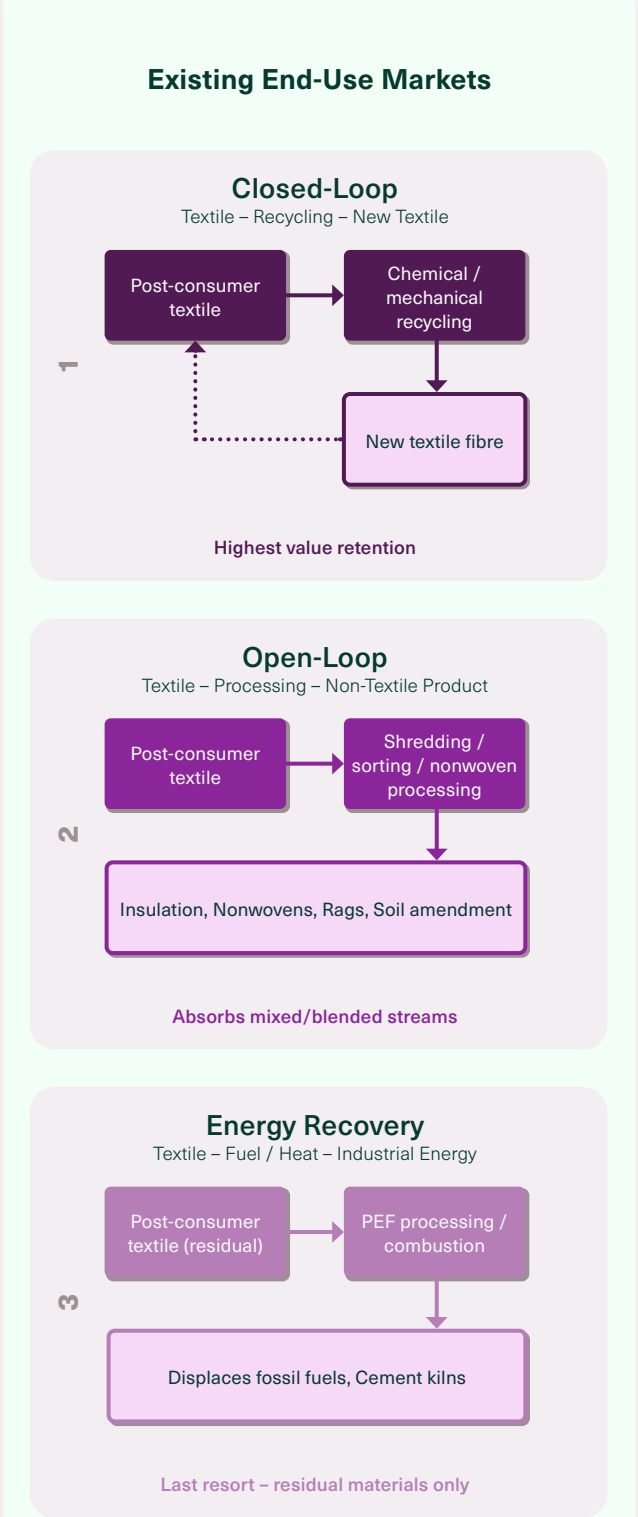


Figure 2: Textile recovery pathway types: closed-loop, open-loop, and energy recovery.

2.0 Methodology

This report used a multi-method approach to identify, evaluate, and prioritize end-use pathways for post-consumer textiles in Nova Scotia. The analysis considered both existing recycling technologies and the pathways most likely to support landfill diversion, green job creation, and bioeconomy development.

Potential pathways were identified through three sources. First, semi-structured interviews with stakeholders across the textile value chain provided insights into industry practices, market conditions, technology requirements, infrastructure gaps, and emerging opportunities. Participants included charitable and for-profit collectors and retailers, wholesalers, exporters, recyclers, manufacturers, equipment suppliers, researchers, and end-market users. Second, a review of industry reports, academic literature, company publications, conference proceedings, and government documents identified relevant technologies, business models, and case studies from Canada and abroad while helping validate interview findings. Third, the lead researcher attended the Textile Recovery Summit in San Diego, CA, US and the Textile Recycling Expo in Charlotte, NC, US. These events enabled direct engagement with technology developers, equipment manufacturers, textile processors, and circular economy practitioners, as well as firsthand observation of operating recovery systems and emerging technologies.

Pathway viability was assessed through a combination of technical, economic, and market considerations.

For each pathway, the analysis considered:

1. **Feedstock fit**
2. **Capital cost**
3. **Job creation**
4. **Market demand**
5. **Diversion potential**
6. **Technology readiness**

Where possible, organizations operating within the selected pathways, along with equipment manufacturers, technology providers, and product developers, were consulted to assess operational requirements, infrastructure needs, implementation barriers, and commercial feasibility. The analysis also incorporated findings from the **TTNS Phase II Waste Characterization Study**, using fibre composition, product category, and condition data to evaluate pathway suitability and the availability of potential feedstocks for future recycling, manufacturing, and circular economy initiatives in Nova Scotia.

2.1 Sampling Approach

Interviews were conducted with 27 stakeholders from across the textile value chain, from collection and reuse through to recycling infrastructure, manufacturing, and end-market demand. The semi-structured interview questions are provided in **Appendix C1 in the Master Report**, while a complete list of interviewees is provided in **Appendix C2 in the Master Report**. Additional sample details, including the stakeholder groups represented and their positions within the textile value chain, are provided in **Appendix C3 in the Master Report**. Because some organizations operate across multiple stages of the value chain, they are listed under each applicable stage.

While some segments of the value chain were more heavily represented in the interview sample than others, this concentration helped corroborate information across participants and strengthen confidence in recurring themes and observations. In contrast, representation from end-market purchasers was limited. Many organizations identified buyers of recycled textile products as commercially sensitive information, making it difficult to directly identify and engage potential purchasers. Nevertheless, interviews and secondary research helped identify several promising end-use sectors for recycled textile materials. Additional outreach was conducted to a number of potential buyers; however, these inquiries did not result in participation.

3.0 Findings

3.1 Current Textile Recovery Capacity in Nova Scotia

In Nova Scotia, infrastructure supporting viable end-use pathways for post-consumer textiles remains limited in both scale and sophistication. The province's textile recovery system is anchored by a network of charitable and for-profit thrift retailers, including The Salvation Army, Society of Saint Vincent de Paul, Bibles for Mission Foundation, Soul's Harbour Rescue Mission, Savers Value Village, Guy's Frenchys, and independent operators such as Hospice Halifax and the SPCA.

Collectively, these organizations receive significant volumes of donated textiles, conduct basic sorting to identify resaleable items, and move surplus material through downstream channels where available. A small number also consolidate unsold inventory into bales for brokers or wholesale buyers, while limited ragging activity exists.

It is worth noting that Nova Scotia possesses elements of a vertically integrated textile recovery system through Guy's Frenchys and its affiliated businesses. Publicly available information indicates the company operates an integrated network of IWK branded collection bins, transportation, retail stores, sorting facilities, wholesale operations, import/export activities, and textile wiping cloth manufacturing *(Acadian Wipers, n.d.; Guy's Frenchys, n.d.)*.

While these operations are primarily oriented toward reuse and secondary markets, they provide an important foundation upon which future domestic textile recycling infrastructure could build. They declined to participate in this study.

Nova Scotia's limited infrastructure is under growing pressure as the downstream markets that local thrift organizations rely on become less stable. Representatives from several organizations described the loss or disruption of collection relationships with the National Diabetes Trust or Big Brothers Big Sisters, which had previously moved surplus textiles out of their facilities. As those channels have contracted, organizations have been left with rising disposal costs and few viable alternatives. The lack of downstream capacity represents both a market development issue and an immediate operational challenge affecting textile recovery organizations across the province.

At the same time, Nova Scotia does not have a systematic inventory of textile collection volumes, sorting throughput, material flows, processing capacity, or disposal costs. This makes it difficult to estimate feedstock availability, assess the scale of the current capacity gap, or size future infrastructure investments with confidence. Developing a provincial baseline inventory (**Recommendation MKT-3**) should therefore be an early priority. Without it, new infrastructure risks being either too small to achieve commercial viability or too large relative to the available material supply.

The **TTNS Phase II Waste Characterization Study** provides the best available indication of the types of materials moving through the system, including their condition, fibre composition, and suitability for different recovery pathways. **Figure 3** shows the movement of textiles from collection to end-use markets. **Appendix C4 in the Master Report** provides a detailed overview of each stage of the value chain in Nova Scotia.

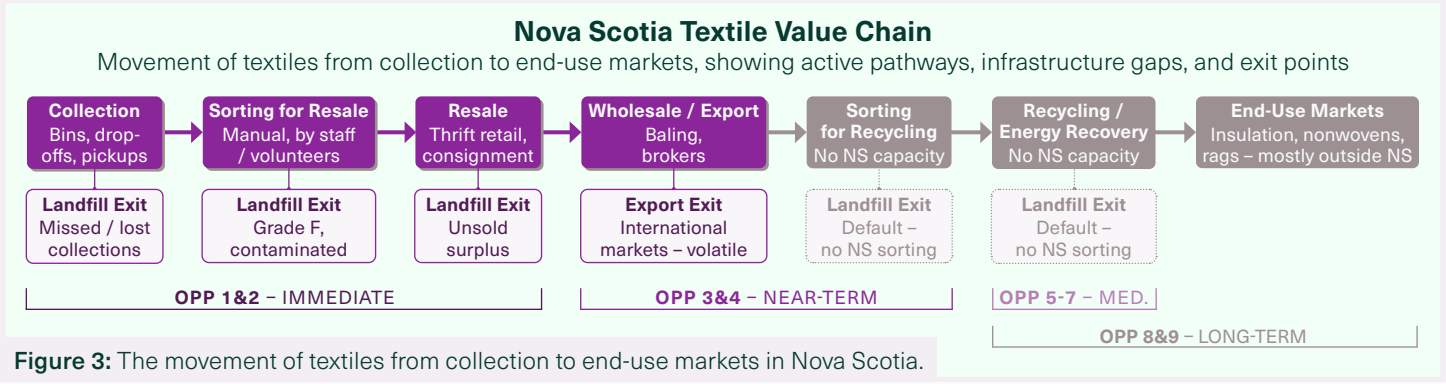


Figure 3: The movement of textiles from collection to end-use markets in Nova Scotia.

Case Study: Salvos (Salvation Army) Stores Textile Recovery Facility
Brisbane, Australia

In March 2026, Salvos Stores, the thrift retail arm of The Salvation Army in Australia, opened a dedicated Textile Recovery Facility in Brisbane, Queensland, representing a significant step beyond traditional thrift retail toward integrated textile circularity. The facility uses automated sorting systems to identify fibre composition and remove hard components such as zippers, buttons, and labels, producing pre-processed feedstock ready for downstream recycling. It has an annual processing capacity of up to 5,000 tonnes of textiles, including donations and commercial take-back streams such as decommissioned uniforms. The project was enabled by a $4.97 million investment from the Queensland Government and was developed in partnership with Queensland University of Technology, local governments, and industry partners *(Enerva, 2026; Salvos Stores, 2024)*.

The facility is directly relevant to the Nova Scotia context for two reasons. First, it demonstrates that a charitable thrift organization operating a reuse-first model can successfully expand into industrial-scale sorting and feedstock preparation when supported by government investment and external partners. Second, The Salvation Army is an active TTNS partner and one of Nova Scotia's largest charitable textile collectors. The infrastructure gap identified in this section could therefore be addressed, at least in part, by an existing and trusted partner operating within an appropriate policy and funding environment.

The Salvos facility is presented as a proven model rather than a direct replication target, as Nova Scotia's textile volumes and capital context differ from those in Queensland. Any comparable investment would need to be appropriately sized and scoped, but the example demonstrates that external partnerships can enable this infrastructure and that the charitable reuse sector can serve as a credible delivery partner.

What is feedstock?

Feedstock refers to the raw or pre-processed material inputs supplied to a manufacturing or recycling process.

In the context of this report, feedstock refers specifically to post-consumer textile materials, including garments and other recovered textile items, that have been **collected**, **sorted**, and **prepared** to serve as inputs for downstream recovery pathways such as insulation manufacturing, nonwoven production, industrial ragging, or mechanical and chemical recycling.

3.2 Nova Scotia's Post-Consumer Textile Feedstock

The viability of different end-use pathways depends on the volume, composition, and condition of materials available within Nova Scotia's post-consumer textile stream. The **TTNS Phase II Waste Characterization Study** provides the first comprehensive assessment of fibre composition, product category, and condition across the province's donation and waste streams. Readers are directed to that report for the full findings; the key data informing the investment recommendations in this report are summarized below.

3.2.1 Condition of items

Nearly half (46.9%) of the 4,664 items assessed were **immediately suitable for resale (Grades A, B, and C)**.

32.7% were considered **potentially recoverable through cleaning or minor repair (Grades D1 and D2)**.

18.0% were end-of-life for reuse but **suitable for fibre recycling (Grade E)**, and only

2.2% were **too contaminated for any recovery pathway (Grade F)**.

These findings reinforce that reuse should remain the primary objective of Nova Scotia's textile recovery system, with recycling reserved for materials that have genuinely exhausted their reuse potential.

3.2.2 Fibre composition

Polyester and cotton were the most prevalent fibres, appearing in 49.0% and 46.1% of items, respectively. Among monofibre items (items composed of one fibre type), **cotton** accounted for 44.9% and **polyester** for 41.0%. Overall, 84.8% of items contained **only one or two fibre types**, supporting easier sorting and compatibility with established recycling pathways.

Cotton-dominant items are well suited to mechanical recycling into nonwoven products such as insulation, acoustic panels, furniture padding, and industrial wiping cloths, and offer longer-term potential for fibre-to-fibre recycling as commercial capacity develops.

Polyester-dominant items represent a significant opportunity for chemical recycling as technology scales internationally.

3.2.3 Denim

Denim represented 3.1% of the overall sample and warrants particular attention because of its **high cotton content and strong alignment with the insulation manufacturing pathway** examined in this report *(Allahyari, Haghparast, & Ahmadi, 2026; Islam et al., 2022)*.

However, 67.4% of denim items in the sample contained elastane, which can disrupt mechanical recycling processes and complicate feedstock preparation *(Choudhury, Tsianou, & Alexandridis, 2024; Rodrigues et al., 2025)*.

This finding highlights the need either to discourage even small percentages of elastane in denim manufacturing or to invest in processing technologies that can accommodate elastane-containing feedstock.

This consideration should inform the design of any denim recovery and insulation pilot. More broadly, elastane was present in 23.7% of all items assessed, indicating that it poses a significant recycling challenge across the textile industry rather than for denim alone *(Choudhury, Tsianou, & Alexandridis 2024; Rodrigues et al., 2025)*.

3.3 Interview Themes

The interview findings centred on four interconnected themes: systemic pressures on the textile reuse sector, value retention and material recovery, domestic end-market development, and policy and market enablers. Full thematic results are provided in **Appendix C5 in the Master Report**.

A dominant concern was the growing instability of traditional downstream markets. Stakeholders described declining commodity values, reduced purchasing activity, export uncertainty, and mounting volumes of unsold textiles. Several charitable retailers noted that the contraction or disappearance of downstream collection, sorting, and resale partners has left them managing increasing volumes of surplus textiles with fewer viable outlets. International policy developments reinforce these observations. As of July 19, 2026, large companies operating in the European Union are prohibited from destroying unsold clothing, accessories, and footwear and must instead consider alternatives such as resale, donation, reuse, remanufacturing, or recycling, subject to limited exemptions *(Martin, 2026)*. Such measures can increase the volume of unsold commercial textiles requiring legitimate reuse and recovery outlets, strengthening the need for corresponding investment in sorting, redistribution, inventory management, and downstream processing capacity.

The growing limitations of export-dependent pathways have strengthened calls for domestic end-market development and greater value retention through both reuse and recycling. Stakeholders emphasized Canada's limited processing capacity and the need for localized solutions that reduce reliance on international markets.

Stakeholders consistently emphasized that policy intervention will be required to accelerate investment and provide a funding mechanism to scale textile circularity, as market forces alone are unlikely to generate sufficient demand for recovered materials or support the infrastructure needed for a circular textile economy.

Frequently cited measures included:

- **Recycled-content mandates**,
- **Government procurement requirements**,
- **EPR programs**, and
- **Tax incentives supporting recovery, reuse, recycling, and domestic manufacturing**.

Together, these mechanisms could help stabilize end markets and enable coordinated investment across collection, sorting, processing, and manufacturing rather than relying on any single recycling technology *(Saif et al., 2024)*.

Interview Results: Themes



Systemic Pressures on the Textile Reuse Sector



Value Retention and Material Recovery



Domestic End-Market Development



Policy and Market Enablers

3.4 Comparative Assessment of End-Use Pathways

The pathways examined in the following sections were informed by stakeholder interviews and are outlined in **Table 1**. Each is assessed against six dimensions and ordered by implementation readiness.

End-Use Pathways

		Pathway	Feedstock Fit	Capital Cost	Job Creation	Market Demand	Diversion Potential	Technology Readiness
IMMEDIATE	1	Surplus Reuse Hub & Sorting Centre	**Very High**	**Low**	**High**	**Strong**	**High**	**Immediate**
	2	Industrial Rags	Medium	**Low**	Medium	**Stable**	Medium	**Immediate**
NEAR-TERM	3	Tech-Enabled Sorting & Preprocessing	**High**	High	Medium	Emerging	**High**	**Near-Term**
	4	Recycled Denim Insulation	**High**	**Medium**	Medium	**Strong**	**High**	**Near-Term Pilot**
MEDIUM-TERM	5	Nonwoven Manufacturing	Medium	High	**High**	Emerging	**High**	Medium-Term
	6	Textile-to-Textile (Mechanical)	Low	High	Medium	**Stable**	Medium	Medium-Term
	7	Environmental Applications	Medium	**Medium**	Low	Low	**High**	Medium-Term
LONG-TERM	8	Textile-to-Textile (Chemical)	Low	Very High	**High**	Emerging	**High**	Long-Term
	9	Process Engineered Fuel	Medium	**Medium**	Medium	**Stable**	Medium	Long-Term / Residual Only

Legend by Column

More Desireable ↓ Less Desireable	Very High High Medium Low	Low Medium High Very High	High Medium Low	Strong Stable Emerging Low	High Medium	Immediate Near-Term Med-Term Long-Term

Table 1: Comparative assessment of end-use pathways for post-consumer textiles in Nova Scotia

3.4.1 Cross-cutting Considerations

Before examining each pathway individually, four cross-cutting considerations apply across multiple opportunities:

1. **Effective sorting** is the essential first step in creating consistent, characterized, and reliably prepared feedstock. Without this foundation, downstream processors and manufacturers cannot source material from Nova Scotia at commercial scale, regardless of the technical promise of a given pathway.
2. **Nova Scotia currently lacks the sorting, shredding, and processing infrastructure** needed to supply recycling or manufacturing partners consistently. As outlined in **Section 3.1 - Current Textile Recovery Capacity**, this is the primary constraint affecting most near- and medium-term pathways.
3. **Some material streams will also require regional aggregation.** Denim and other cotton-rich textiles, for example, must be collected from multiple organizations to reach commercially viable volumes, as no single Nova Scotia organization generates sufficient feedstock independently.
4. **Finally, most pathways will require policy support to become commercially viable.** Measures such as procurement requirements, recycled-content mandates, and product stewardship programs including funding models should therefore be treated as enabling conditions rather than optional accelerants.



Opportunity Summary

IMMEDIATE

OPP-1 **Surplus reuse & sorting hub**
Centralized aggregation, sorting, and redistribution of surplus textiles to extend garment life.

OPP-2 **Industrial rags**
Sorting cotton-rich and absorbent textiles into wiping cloths..

NEAR-TERM

OPP-3 **Technology-enabled sorting & preprocessing for end-markets**
Sorting textiles into streams for automotive, manufacturing, construction, and institutional use.

OPP-4 **Recycled denim insulation**
Mechanical processing into acoustic and thermal insulation for construction.

MEDIUM-TERM

OPP-5 **Nonwoven manufacturing**
Converting shredded and fibreized post-consumer textiles into engineered nonwoven materials.

OPP-6 **Textile-to-textile recycling (mechanical)**
Blending and respinning sorted and shredded fibre into new yarn and fabrics.

OPP-7 **Environmental applications**
Using textile shred as soil reinforcement, pavement additive, or char for agricultural use.

LONG-TERM

OPP-8 **Textile-to-textile recycling (chemical)**
Breaking down fibres into molecular inputs to produce virgin-equivalent recycled fibre.

OPP-9 **Process engineered fuel**
Processing mixed residential textile waste into standardized fuel that displaces fossil fuels.

3.4.2 Opportunity 1: **Surplus Reuse & Sorting Hub**

Centralized aggregation, sorting, and redistribution of surplus textiles to extend garment life before any recycling pathway is considered.

Feedstock Fit	Capital Cost	Job Creation	Market Demand	Diversion Potential	Technology Readiness
Very High	**Low**	**High**	**Strong**	**High**	**Immediate**

A Surplus Reuse and Sorting Hub would provide centralized sorting, aggregation, and redistribution for textiles that cannot be sold through conventional thrift channels. The hub would prioritize reuse by directing wearable items into pay-by-the-pound retail, low-cost resale, bulk wholesale, and community redistribution programs before any material is directed to recycling or recovery. This reuse-first approach reflects the greater environmental, social, and economic value of resale and redistribution over material recycling (NACTR, 2023; Walsh et al., 2026). It also creates the aggregation function on which every downstream recycling pathway depends, making it the essential first node in any future circular textile system for Nova Scotia.

Infrastructure requirements are moderate: warehouse and sorting space, baling equipment, logistics systems, and retail or bulk-sale capacity. The hub can accept mixed textile streams and does not require advanced processing technology. By consolidating material from multiple organizations, it can achieve the volume and consistency needed to access wholesale and downstream recycling markets that individual charities cannot reach independently. Existing models, including Goodwill Industries' outlet and pay-by-the-pound operations in Ontario and Alberta, demonstrate that this approach can process high volumes, generate revenue, and create employment with relatively modest investment. An additional opportunity may emerge from the transition underway in Nova Scotia's Material Recovery Facility (MRF) network, where existing smaller facilities could be adapted for textile aggregation and preprocessing at lower capital cost than purpose-built facilities (M. Goodick, personal communication, 2026).

Interviews confirmed the urgency. Nova Scotia charities across the province described growing inventories, limited storage, rising disposal costs, and the loss of reliable surplus collection outlets. The operational and financial barriers associated with establishing a hub are considerably lower than those of any recycling infrastructure investment, making this the most immediately actionable opportunity identified in this research.

Assessment for Nova Scotia

Priority: Immediate

Directly addresses the operational crisis affecting thrift retailers across the province. Modest capital requirements, immediate deployment potential, and dual function as both a reuse outlet and an aggregation node for downstream pathways make this the highest-priority investment in the system.

3.4.3 Opportunity 2: **Industrial Rags**

Sorting cotton-rich and absorbent textiles into wiping cloths for automotive, manufacturing, and institutional use.

Feedstock Fit	Capital Cost	Job Creation	Market Demand	Diversion Potential	Technology Readiness
Medium	**Low**	Medium	**Stable**	Medium	**Immediate**

Industrial ragging converts absorbent textiles, particularly cotton-rich garments, towels, sheets, and flannels, into wiping cloths for automotive, manufacturing, marine, construction, and institutional settings (Acadian Wipers, n.d.; Cross Plains Trading, n.d.). The pathway is already active in Nova Scotia: several thrift organizations including Guy's Frenchys currently sell cotton, microfibre, and linen items in bulk bags for cleaning use, generating modest revenue while reducing disposal costs. Infrastructure requirements are minimal, including sorting tables, cutting equipment, and bagging or baling capacity, and the pathway can be integrated directly into a Surplus Reuse and Sorting Hub as a secondary outlet for clean, absorbent materials unsuitable for resale.

Feedstock must be clean, dry, and free from significant contamination. Cotton-rich textiles are preferred for their absorbency, though microfibre and some synthetics may have value in niche markets.

Market demand is stable but modest: industrial wiping cloths compete with imported rags and disposable wipes, and low margins combined with labour-intensive sorting can undermine viability if feedstock quality is inconsistent.

The pathway cannot absorb Nova Scotia's full textile surplus and should not be positioned as a primary circularity strategy.

Assessment for Nova Scotia

Priority: Immediate Supporting Pathway

A practical, low-cost supporting outlet for a specific material subset. Best integrated into a Surplus Reuse and Sorting Hub rather than operated as a standalone pathway. Diversion potential is moderate and its role is supplementary.

3.4.4 Opportunity 3: **Technology-Enabled Sorting & Preprocessing for End-Markets**

Sorting textiles into streams for automotive, manufacturing, and institutional use.

Feedstock Fit	Capital Cost	Job Creation	Market Demand	Diversion Potential	Technology Readiness
High	High	Medium	Emerging	**High**	**Near-Term**

Shared sorting and preprocessing infrastructure would create the consistent, characterized feedstock needed to access downstream markets for unwearable and non-reusable textiles. Without it, processors producing shoddy, stuffing, nonwovens, insulation, or other recycled products cannot reliably source material from Nova Scotia at commercial scale.

A shared facility would separate cotton-rich, polyester-rich, denim, wool, and blended streams, prepare them to buyer specifications, and aggregate volume from multiple organizations to reach the scale that individual charities cannot achieve independently. Outputs could include natural fibre streams for shoddy and stuffing production, denim and heavy cotton prepared as shred for insulation manufacturing, and characterized streams for nonwoven production.

Near-term implementation can rely on manual sorting with standardized protocols and basic shredding equipment. Interviews indicated that a pilot-scale shredder for pre-sorted feedstock represents an estimated capital investment of approximately $200,000. Over time, near-infrared or hyperspectral fibre identification technology such as Refiberd's hyperspectral imaging system *(Refiberd, n.d.)* or ANDRITZ's Palanc sorter *(ANDRITZ, 2023)* could be incorporated to improve throughput, accuracy, and access to more demanding downstream markets. Co-location with the Surplus Reuse and Sorting Hub would minimize logistics costs and create an integrated intake node for the provincial system. This investment is not tied to a single downstream application, making it resilient to market fluctuations as feedstock can be redirected between pathways as conditions change.

Assessment for Nova Scotia

Priority: Near-Term

The essential infrastructure bridge between the collection system and any viable downstream end market. Without sortig and preprocessing capacity, no other recycling or manufacturing pathway can be reliably supplied. Priority is second only to the Surplus Reuse and Sorting Hub, and the two should be planned as a phased, integrated system.

3.4.5 Opportunity 4: **Recycled Denim Insulation**

Mechanical processing of denim and cotton-rich textiles into acoustic and thermal insulation for commercial and residential construction.

Feedstock Fit	Capital Cost	Job Creation	Market Demand	Diversion Potential	Technology Readiness
High	**Medium**	Medium	**Strong**	**High**	**Near-Term Pilot**

Denim insulation mechanically converts denim and other cotton-rich textiles into acoustic or thermal insulation batts, pads, or panels through sorting, hardware removal, shredding or fibreizing, and nonwoven web formation. The pathway connects textile diversion directly with growing demand for lower-carbon building materials in residential and commercial construction, and offers thermal performance comparable to traditional fiberglass ("glass wool") insulation while supporting green building, LEED, and bioeconomy objectives *(Read, 2021; Krippendorf, 2011)*.

Canada's insulation market is projected to reach USD $2.5 billion by 2033 (Grand View Research, 2025), with demand driven by building retrofits, energy efficiency requirements, and sustainable procurement standards increasingly embedded in architect and engineering firm practices.

The strongest evidence supporting this pathway is confirmed end-market demand. A Calgary-based manufacturer of prefabricated interior wall systems that was interviewed currently uses US-sourced recycled denim insulation and has expressed interest in sourcing domestically, noting that current logistics require shipping offcuts back to their US supplier at significant cost.

Quebec-based Jasztex produces comparable products commercially under its Blue Jeanious® brand, confirming that the pathway is beyond pilot stage in Canada (Jasztex, n.d.). Feedstock fit is favourable: denim is cotton-rich, durable, and mechanically processable, though high elastane content (present in 67.4% of denim items in the TTNS Phase II sample) complicates processing and must be managed through sorting or compatible processing technology. Infrastructure requirements and investment sequencing are described in **Opportunity 3**; implementation risk can be reduced by beginning with denim shred supply to existing manufacturers (Stage 1) before progressing to pilot-scale insulation manufacturing through a full-service textile R&D facility like Vestechpro (Montreal, QC) or a comparable contract R&D facility (Stage 2). Because denim represented approximately 3.1% of the **TTNS Phase II Waste Characterization** sample, regional aggregation from multiple organizations will be required to support commercial volumes.

The primary barriers are cost competitiveness with conventional glass wool insulation, certification requirements, and consistent feedstock supply at scale. Supportive procurement policy, such as minimum recycled textile content requirements in government construction and the built environment, would improve commercial viability.

Assessment for Nova Scotia

Priority: Near-Term Pilot

Nova Scotia's strongest near-term manufacturing opportunity. Confirmed market demand, proven technology, alignment with green building procurement, and a clear two-stage route to commercialization make this the recommended priority pilot investment. Proposed next step: denim sorting protocol and Stage 1 shred supply to existing manufacturers.

3.4.6 Opportunity 5: **Nonwoven Manufacturing**

Converting shredded and fibreized post-consumer textiles into engineered nonwoven materials for automotive, construction, furniture, and appliance applications.

Feedstock Fit	Capital Cost	Job Creation	Market Demand	Diversion Potential	Technology Readiness
Medium	High	**High**	Emerging	**High**	Medium-Term

Nonwoven manufacturing converts shredded and fibreized post-consumer textiles into engineered materials through airlaying, carding, needle punching, and thermal bonding. Applications include automotive sound barriers and trunk liners, appliance insulation, carpet underpadding, cushioning, and construction products. The pathway is more scalable than industrial ragging and less fibre-specific than denim insulation, and can accommodate a broader range of blended feedstocks provided composition is known and consistent. This makes it particularly relevant for Nova Scotia's mixed textile stream *(Heinrich et al., 2026)*. Interview findings consistently identified automotive, appliance, construction, and furniture products as the strongest end markets, with manufacturers such as Leigh Fibers, Cross Plains Trading, and Autoneum (which has Ontario facilities) already supplying recycled textile fibres into these sectors.

Infrastructure requirements are substantial. A commercial production line requires fibre opening, contaminant removal, precision blending, and quality control, with an estimated capital investment of approximately $8-10 million to establish operations *(E. Hull, personal communication, June 2, 2026)*. Shredding equipment alone ranges from approximately $200,000 for pilot-scale to $800,000+ for commercial units. European facilities demonstrate integrated systems combining automated sorting, fibre preparation, and nonwoven production in a single line *(ANDRITZ, 2023)*. Because major automotive and appliance manufacturers are concentrated outside Atlantic Canada, near-term opportunities are more likely to lie in supplying intermediate materials for construction, marine, and packaging applications before expanding into larger North American markets. Success will depend on regional feedstock aggregation, pilot validation, and identification of anchor customers.

Assessment for Nova Scotia

Priority: Medium-Term Strategic Investment

One of the most promising medium-term opportunities in terms of market breadth and job creation potential. Capital requirements and feedstock consistency make this a second-stage investment after the reuse hub and denim insulation pilot are established. Infrastructure developed for denim insulation directly creates the foundation needed here.

3.4.7 Opportunity 6: **Textile-to-Textile Recycling (Mechanical)**

Sorting and shredding post-consumer textiles into fibre that is blended and respun into new yarn and fabrics, typically with added virgin fibre.

Feedstock Fit	Capital Cost	Job Creation	Market Demand	Diversion Potential	Technology Readiness
Low	**High**	**Medium**	**Stable**	**Medium**	**Medium-Term**

Mechanical textile-to-textile recycling processes sort monofibres or predictable blend streams into fibre that can be respun into new yarns, typically with virgin fibre added to compensate for the fibre shortening that occurs during mechanical shredding. The pathway requires considerably more precise feedstock than reuse, ragging, insulation, or nonwoven manufacturing: experts indicated that only a small share of post-consumer textiles are likely suitable for respinning, and that success depends on advanced fibre identification, trim removal, carding, spinning/remanufacturing capacity, and extensive quality testing.

This is infrastructure Nova Scotia does not currently possess. Near-term participation is therefore more likely through feedstock aggregation and preprocessing than through full manufacturing, which would require regional partnerships, larger volumes, and substantial capital investment.

Market demand for mechanically recycled textile fibre is stable but constrained by cost, performance requirements, and the absence of mandated recycled content requirements. Without policy mechanisms such as EPR or recycled content mandates, the economics of this pathway remain challenging relative to reuse, sorting, insulation, and nonwoven production. It is best understood as a longer-term opportunity that becomes more viable as regional infrastructure matures and policy support develops.

Assessment for Nova Scotia

Priority: Long-Term Preparation / Medium-Term Partnerships

Not a near-term priority. Foundational investments in sorting, fibre identification, and aggregation infrastructure recommended in earlier opportunities will lay the groundwork for participation in mechanical textile-to-textile recycling as market conditions and policy support evolve.

3.4.8 Opportunity 7: **Environmental Applications**

Using textile shred as a soil reinforcement or pavement additive, or converting textile waste into char for agricultural use as a soil amendment.

Feedstock Fit	Capital Cost	Job Creation	Market Demand	Diversion Potential	Technology Readiness
Medium	**Medium**	Low	Low	**High**	Medium-Term

Two environmental applications are relevant in the Nova Scotia context. Research has demonstrated that small proportions of shredded polyester textile (0.75-1% by weight) can improve load-bearing capacity and toughness in road subbase materials *(Guzman & Payano, 2023)*, while recycled cotton fibres incorporated at 0.3% into stone mastic asphalt can reduce binder drainage, improve moisture resistance, and increase resistance to deformation *(Olaso-Cerveró et al., 2025)*. These applications could divert locally generated textile waste into road construction and maintenance with no specialized chemical processing required. However, field validation, fibre optimization, and compliance testing would be needed before broader adoption, and both studies identify this as pre-commercial.

The second application converts end-of-life textiles into char through pyrolysis or carbonization. A Canadian pilot commissioned by Fashion Takes Action, led by Fanshawe College and Western University, and involving Goodwill Ontario Great Lakes as a materials partner, found that char derived from poly/cotton hospital textiles approximately doubled leaf growth and increased both shoot and root biomass at low application rates (Fashion Takes Action, n.d.). This pathway is particularly relevant for blended textiles that cannot be directed to fibre recycling systems. Before broader adoption, further field trials across different crops and soil conditions, agricultural certification, and assessment of contamination risks from dyes and legacy chemicals would be required.

Assessment for Nova Scotia

Priority: Long-Term / Exploratory

Early-stage but directly promising for mixed or blended textiles that lack viable pathways elsewhere. Nova Scotia's agricultural sector and active bioeconomy interest support future char pilot work. The pavement application has relevance given ongoing commercial deployment; both merit monitoring and exploratory partnership development.

3.4.9 Opportunity 8: **Textile-to-Textile Recycling (Chemical)**

Breaking down polyester or cellulosic fibres chemically into molecular inputs to produce virgin-equivalent recycled fibre for new textile manufacturing.

Feedstock Fit	Capital Cost	Job Creation	Market Demand	Diversion Potential	Technology Readiness
Low	Very High	**High**	**Emerging**	**High**	Long-Term

Chemical textile-to-textile recycling breaks fibres, particularly polyester or cellulosic materials, down to their molecular building blocks, which are then reconstituted into virgin-equivalent fibre (via pellets, powder, or chips) for new textile manufacturing. It represents the most technically advanced and capital-intensive pathway assessed, with the potential to produce high-quality, traceable recycled fibre for premium apparel supply chains. Leading commercial operators include Reju (polyester), Circ and Hybridworks (blended fibres), and Circulose (cotton/cellulosic). However, the pathway is not yet a realistic standalone investment priority for Nova Scotia.

Feedstock requirements are strict: Reju, for example, requires an average of 70% polyester content, material identification by partners, removal of hard points, and preprocessing into patches or pellets prior to processing *(E. Joo, personal communication, June 16, 2026)*. Furthermore, elastane-containing feedstocks pose particular challenges.

Scale requirements are also a significant barrier: Reju's regeneration hubs require approximately 60,000 metric tonnes of annual feedstock which is higher than what Nova Scotia alone could supply. A Nova Scotia-based plastic recycler, Sustane Technologies, also cautioned that textile feedstocks can be technically difficult, with nylon in particular causing processing problems. However, Sustane possesses pyrolysis facilities that are in theory capable of processing polyester textiles into light distillate used as a feedstock for plastic (Sustane Technologies, n.d.), and could be considered for a pilot or proof of concept project. Market demand is emerging but strongly policy-dependent: interviewees identified EPR legislation and recycled-content mandates in jurisdictions such as California and the EU as the primary drivers of near-term commercial viability. Without such mechanisms, brand demand remains uncertain and the cost premium of chemically recycled fibre over virgin materials remains a barrier *(Heinrich et al., 2026)*.

Assessment for Nova Scotia

Priority: Long-Term / Regional Participation Only

A long-term opportunity rather than a near- or medium-term investment priority. Given the significant capital requirements, feedstock demands, and scale needed to support a viable chemical recycling facility, the province is likely better positioned to participate within broader regional or national recycling networks than to develop a standalone facility.

3.4.10 Opportunity 9: **Process Engineered Fuel**

Processing mixed residual textile waste into standardized fuel that displaces fossil fuels in industrial applications such as cement production.

Feedstock Fit	Capital Cost	Job Creation	Market Demand	Diversion Potential	Technology Readiness
Medium	**Medium**	Medium	**Stable**	Medium	Long-Term / Residual Only

Process Engineered Fuel (PEF) is produced by processing mixed dry residual waste, including contaminated, heavily blended, or otherwise unrecyclable textiles, into a standardized fuel for high-temperature industrial applications.

Textiles can enter PEF systems with minimal preparation, making it potentially useful for materials rejected from other pathways. The process recovers energy rather than material value, and should therefore be treated as a last-resort outlet rather than a primary diversion strategy.

PEF is commercially established in markets such as Japan and South Korea, where waste-derived fuels are used in cement manufacturing *(Heinrich et al., 2026)*. Demand in Nova Scotia is currently unknown and would depend on the availability of suitable industrial users, local processing capacity, and the economics of transportation. Textiles must be managed carefully within PEF systems, as dyes and fillers can increase ash content and fibrous material can cause handling difficulties, limiting the proportion of textiles that can be incorporated (ibid.). Higher-value open- and closed-loop recycling pathways should take precedence wherever technically and economically feasible.

Assessment for Nova Scotia
Priority: Long-Term / Residual Only

Not a strategic investment priority. PEF may serve a practical residual role for materials that cannot be directed to any reuse or recycling pathway, but local demand is unconfirmed and further market scoping would be required before operationalization. Should be considered only after higher-value options have been exhausted.

4.0 Economic Opportunity

Reframing post-consumer textiles as a material resource rather than a waste stream creates a meaningful economic opportunity for Nova Scotia. **Figure 4** shows a snapshot of key statistics related to the economic opportunity in Nova Scotia. Note: Association for Textile Recycling (AFTeR) figures are from 2020 and reflect member organizations only (a subset of the full industry).

Table 2 on the following page outlines how developing domestic end-use pathways could support new industries, create jobs, and contribute to provincial economic and environmental goals and positive social outcomes.

4.1 Alignment with Provincial Economic Priorities

The investments described in this report align directly with several of Nova Scotia's economic priorities as articulated in Budget 2026-27: Defending Nova Scotia *(Nova Scotia Finance and Treasury Board, 2026)*. The budget identifies housing and construction as one of six priority sectors for strategic growth, a trend that strengthens the near-term market case for domestically produced recycled denim insulation.

More broadly, the budget's emphasis on fiscal discipline and reducing dependence on a small number of economic drivers reinforces the case for building resilient, diversified local industries.

A circular textile economy built around Nova Scotia's existing charitable infrastructure, green building demand, and Atlantic Canadian feedstock would contribute employment, manufacturing activity, and diversion value without requiring the scale of public investment that other priority sectors demand.

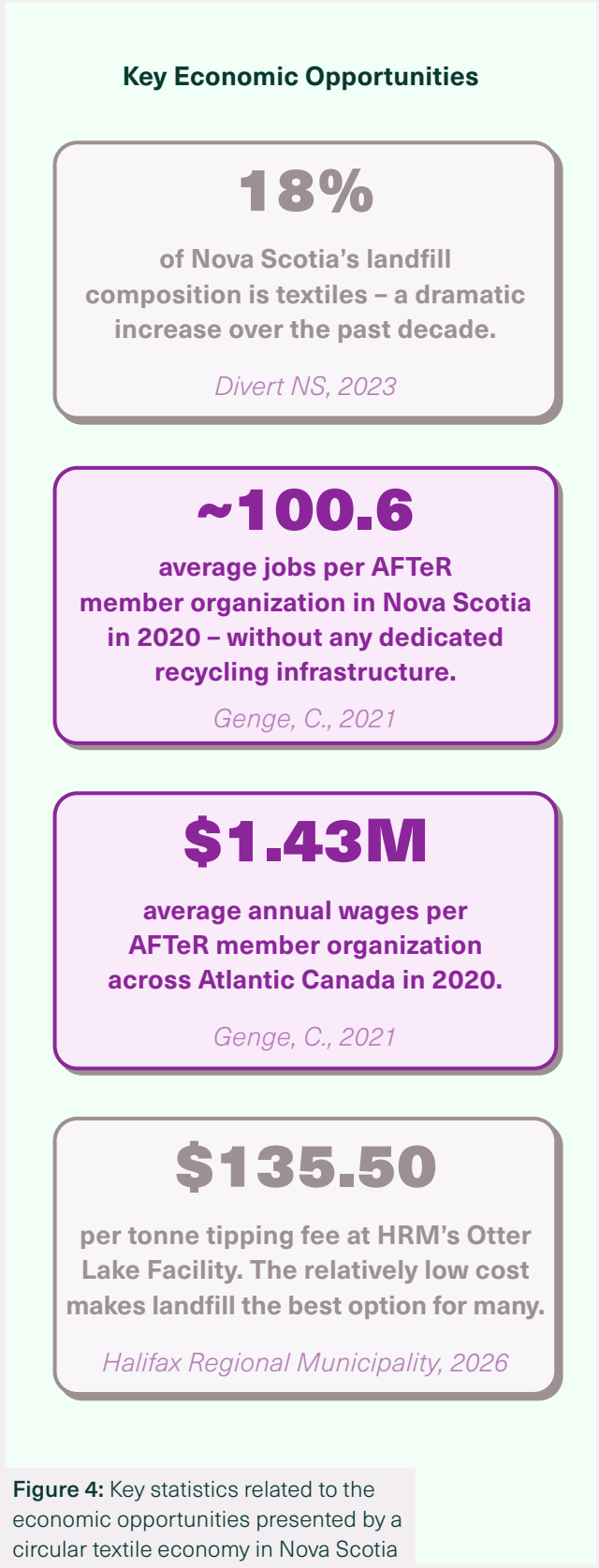


Figure 4: Key statistics related to the economic opportunities presented by a circular textile economy in Nova Scotia

Economic, Employment, and Social Opportunities

Economic Opportunity Building domestic textile recovery capacity displaces import dependence, reduces disposal costs, and supports new manufacturing activity.	Employment Potential The sector already generates substantial employment in Atlantic Canada. Infrastructure investment would expand this across a wider range of roles and skill levels.	Social Value Textile recovery creates environmental and social outcomes simultaneously in a sector well suited to Nova Scotia's social enterprise ecosystem.
$2.5B projected value of Canada's insulation market by 2033 – a near-term domestic market for denim insulation products. *(Grand View Research, 2025 (USD))*	**197.3 total jobs** created by AFTeR member organizations across Atlantic Canada in 2020, without any dedicated recycling or manufacturing infrastructure. *(Genge, C., 2021)*	**10+ tonnes of unwearable clothing** decommissioned for recycling in Australia by BlockTexx, a chemical recycler, and Help Enterprises, a social enterprise providing supported employment for people living with disabilities. *(Help, 2023)*
Domestic processing retains both **material value** and **economic activity** within Nova Scotia rather than exporting it.	**Accessible roles** like sorting, baling, detrimming, and cutting that are suited to a wide range of workers including those facing barriers to employment.	Nova Scotia's **charitable thrift sector** and **social enterprise network** offer comparable conditions for the same kind of partnership as this international example.
Recovering textiles displaces virgin inputs in construction and automotive markets, **reducing embodied carbon**.	**Skilled roles** like equipment operation, quality control, logistics, and manufacturing management in denim insulation and nonwoven production.	Sorting, decommissioning, and preprocessing roles are structured, hands-on and well-suited to **supported employment programs** – the kind of work social enterprise partners are designed to deliver.
As landfilling increases, recovery infrastructure becomes an increasingly attractive **long-term investment** relative to disposal.	**Technical roles** spanning engineering, materials science, and fibre identification as sorting automation and chemical recycling infrastructure matures over the longer term.	Nova Scotia's social enterprise and supported employment ecosystem, including organizations connected to DirectionNS Council, could be integrated into textile recovery operations from the outset, strengthening both **economic and social returns**.
Nova Scotia-specific **economic modelling** quantifying job creation, diversion value, and manufacturing output is recommended as an early investment to strengthen the case for public and private capital.	Interviewees consistently identified **job creation** as central to the case for domestic processing over export.	Surplus reuse and redistribution programs would **improve access to affordable clothing** for lower-income Nova Scotians, creating a direct social equity benefit alongside environmental outcomes.

Table 2: Economic, employment, and social opportunities presented by a circular textile economy in Nova Scotia

5.0 Barriers and Enabling Conditions

Table 3 maps the structural barriers currently limiting textile recovery in Nova Scotia against the enabling conditions that would address them. In most cases these are directly related; the enabling condition is the active response to the barrier it faces. Where relevant, the corresponding recommendation from the next section of this report is identified.

Addressing these conditions in parallel with infrastructure investment is essential; no single pathway will succeed if the surrounding system conditions remain unchanged.

It is also important to note that EPR is the overall enabler as the model that would fund much of this work.

Economic, Employment, and Social Opportunities

Theme	Current Barrier What is limiting the system today?	Enabling Condition What would address it, and which recommendation delivers it?
Fragmented value chain & poor coordination	**Collectors** lack clear guidance on what downstream processors require. **Processors and manufacturers** have limited access to prepared Atlantic Canadian feedstock. **Buyers** have little visibility into what the provincial stream can supply. **Product designs** combining multiple fibre types further complicate end-of-life sorting and processing, and there is no coordinating body to align these actors.	A **provincial textile value chain coordination body**, housed within an existing organization such as Divert NS or NACTR, would establish common grading standards and feedstock specifications, facilitate matchmaking between surplus producers and downstream buyers, and develop material flow tracking frameworks. **Standardized reporting** would also strengthen the evidence base for future EPR and stewardship design. **MKT-3** Baseline Study **MKT-5** Value Chain Coordination Body
Absent processing infrastructure	Nova Scotia has **no industrial-scale textile sorting infrastructure, no dedicated shredding or fibre-opening equipment,** and **no nonwoven or insulation manufacturing capacity**. Organizations **cannot supply downstream recyclers or manufacturers** at commercial scale because the intermediate processing steps between collection and end-use do not exist in the province.	Near-term investments in a **Surplus Reuse and Sorting Hub** would create the foundational infrastructure the system currently lacks. Adaptive reuse of transitioning MRF facilities offers a lower-capital entry point. A **pilot-scale shredder for pre-sorted denim feedstock** (est. ~$200,000) represents the most capital-efficient first manufacturing investment. Over time, **fibre identification technology** and **nonwoven manufacturing** capacity can be added as feedstock volumes, product validation, and market relationships are confirmed. **MKT-1** Surplus Reuse Hub **MKT-2** Denim Insulation Pathway

Table 3: Themes from interviews and associated barriers, enabling conditions, and recommendations

Theme	Current Barrier What is limiting the system today?	Enabling Condition What would address it, and which recommendation delivers it?
Feedstock quality & consistency	**Post-consumer textiles are inherently heterogeneous.** The growing prevalence of blended fibres, synthetic coatings, elastane, and embedded hardware makes processing more complex and costly. Without sorting and preprocessing infrastructure to prepare feedstock to downstream specifications, Nova Scotia **cannot reliably supply any recycling or manufacturing partner** at commercial scale.	Focusing near-term sorting on **higher-quality, more consistent streams**, particularly cotton-rich materials and denim, can produce reliable, lower-contamination feedstock for initial manufacturing pilots. Manual sorting with **standardized grading protocols** can achieve this in the near term; investment in **NIR or hyperspectral fibre identification technology** would improve throughput and accuracy over time. Upstream **EPR design** that eco-modulates fees based on fibre simplicity and recyclability would improve stream quality at the source over the longer term. **MKT-2** Denim Insulation Pathway **MKT-5** Value Chain Coordination Body **MKT-6** Stewardship Program
High costs & limited commercially viable pathways	The current tipping fee at HRM's Otter Lake Waste Facility is $135.50 per tonne (HRM, 2026), and Atlantic Canadian charitable textile organizations spent an average of **$35,336 on landfill hauling and tipping** in 2020, a figure that has likely since increased *(Genge, 2021)*. Recovery infrastructure requires **upfront investment** in sorting, equipment, labour, and warehousing. Recycled feedstock must also **compete with lower-cost virgin materials**, making most pathways commercially unviable without policy support. When charities can no longer absorb surplus textiles, **disposal costs transfer to the municipal system** rather than disappear.	Government infrastructure grants, green procurement requirements for recycled textile content in public construction would **close the cost gap** between recovery and disposal. Landfill volumes are expected to rise making recovery infrastructure an increasingly attractive **long-term investment**. A mandatory **product stewardship scheme** is the most comprehensive mechanism, shifting costs upstream to producers and generating sustained funding for collection, sorting, and processing across the value chain. **MKT-4** Green Procurement Policy **MKT-6** Stewardship Program
Limited end-markets & demand uncertainty	Domestic end-use markets for recovered textile materials remain **nascent** in Nova Scotia and Canada. Uptake is **constrained** by product quality variability, price competitiveness with virgin and imported alternatives, and underdeveloped demand signals. In the absence of policy requirements, potential buyers remain **cautious** and investment in supply-side infrastructure is difficult to justify.	Confirmed demand for Canadian-sourced recycled denim insulation represents an **immediately actionable market entry point**. **Government green procurement requirements** for recycled textile content in insulation and the build environment more broadly would create stable, policy-backed demand without waiting for EPR. A **baseline economic study** quantifying the provincial opportunity would strengthen the investment case for private capital. **MKT-2** Denim Insulation Pathway **MKT-3** Baseline Study **MKT-4** Green Procurement Policy

Table 3, continued: Themes from interviews and associated barriers, enabling conditions, and recommendations

Theme	Current Barrier What is limiting the system today?	Enabling Condition What would address it, and which recommendation delivers it?
Policy gaps	No **EPR or stewardship framework** exists for textiles in Canada. **Recycled content mandates and dedicated procurement policies** for textile-derived materials are absent at both federal and provincial levels. Without these mechanisms, the funding mechanisms and market conditions needed to support commercial-scale textile recycling are **unlikely to emerge organically**. Policy development is not a background consideration, it is a **precondition for the long-term viability** of most pathways identified in this report.	Nova Scotia should position itself as an active participant in national textile policy development through engagement with **ECCC's Zero Plastic Waste agenda** and coordination with other provinces. Domestically, near-term mechanisms like **infrastructure grants, green procurement requirements**, and a **provincial textile coordination body** can begin shifting the economics of recovery without waiting for federal EPR. Advocacy for **EPR design** that protects and builds on existing reuse infrastructure, rather than displacing it, is equally important. **MKT-4 Green Procurement Policy** **MKT-5 Value Chain Coordination Body** **MKT-6 Stewardship Program**
Export market instability	Nova Scotia's textile recovery system remains **heavily dependent on export and wholesale markets** that are rupturing. Declining commodity prices, geopolitical disruptions, rising shipping costs, and tightening import restrictions in receiving countries mean that many charitable organizations can no longer find buyers for surplus textiles that previously moved out of their facilities at no cost, resulting in **growing storage backlogs** and **rising disposal costs**.	**Developing domestic end-use pathways**, beginning with a Surplus Reuse and Sorting Hub and denim insulation pilot, would reduce dependence on export channels over time by creating alternative outlets for surplus and unwearable textiles within Nova Scotia and Canada. Export markets should be maintained as a **transitional channel** while domestic alternatives are built, and bale quality improvements would **maximize per-pound returns** in the interim. **Regional feedstock aggregation** across Atlantic Canada would increase the scale and reliability of domestic supply chains, making them more attractive to domestic manufacturers than small-volume provincial streams alone. **MKT-1 Surplus Reuse Hub** **MKT-2 Denim Insulation Pathway**
Donation quality & public behaviour	High rates of contaminated, damaged, or non-resalable material enter donation streams, **increasing sorting burden and disposal costs**. Misclassification of wearable and unwearable items affects both reuse and recycling streams, and differing organizational standards make **system-wide coordination difficult**. For more detail, see the **TTNS Phase II Waste Characterization Study** and **Donation Etiquette Analysis**.	**Donor education campaigns** aligned with common messaging across charitable organizations can reduce contamination and improve the proportion of material suitable for resale or recycling. A centralized **Surplus Reuse and Sorting Hub** with **standardized intake protocols** would help regularize grading and reduce textiles sent to landfill across organizations. Upstream **EPR policy** that incentivizes producers to improve garment durability and simplify fibre constructions would reduce the volume of low-quality material entering the stream over time. **MKT-1 Surplus Reuse Hub** **MKT-6 Stewardship Program**

Table 3, continued: Themes from interviews and associated barriers, enabling conditions, and recommendations

6.0 Recommendations

The recommendations that follow are identified with the prefix **"MKT"** to distinguish them from recommendations presented in the other **TTNS Phase II** deliverables.

Master Recommendation Key

Waste Characterization Study
MAT = Material

Donation Etiquette Analysis
BEH = Behaviour

End-Use Pathways Brief
MKT = Market



Recommendation Summary

HIGH PRIORITY

MKT-1 **Establish a provincial textile aggregation, reuse, and sorting hub**
Prioritizing a hub could reduce storage and disposal costs while creating consistent supply streams.

MKT-2 **Develop a denim recovery and insulation manufacturing pathway in two stages**
Establishing capacity could validate viability and profitability.

MKT-3 **Commission a provincial textile capacity and economic baseline study**
Quantifying collection volumes and disposal costs could create a defensible basis for investment.

MEDIUM PRIORITY

MKT-4 **Develop a provincial green procurement policy for recycled textile content in the built environment**
Establishing minimum recycled textile content thresholds could signal demand.

MKT-5 **Establish a textile value chain coordination body and standardized data**
Defining common standards could facilitate stronger supply relationships and frameworks.

MKT-6 **Advocate and prepare for a mandatory provincial textile stewardship program**
Preparing for EPR textile waste reduction goals could position NS to participate effectively.

MKT-1 Establish a Provincial Textile Aggregation, Reuse, and Sorting Hub

Priority: High ▲

Audience: Bioeconomy incubators and accelerators; Provincial government; NACTR; Thrift retailers

Nova Scotia's charitable and independent thrift retailers are currently unable to move surplus inventory, generating accumulating storage costs and increasing landfill disposal, a crisis that cannot wait for recycling infrastructure to mature. A centralized reuse and sorting hub addresses this immediate operational pressure while simultaneously creating the aggregation function every downstream recycling and manufacturing pathway in this report depends on.

Evidence from TTNS

- Charitable retailers and thrift operators across the province are currently unable to move surplus inventory, generating accumulating storage costs and increasing landfill disposal.
- No existing facility performs the basic sorting and baling functions needed to create consistent feedstock streams for near-term recovery pathways.
- Every downstream recycling and manufacturing pathway identified in this research depends on a functioning aggregation point.
- Adaptive reuse of transitioning Materials Recovery Facilities (MRFs) was identified as a potentially lower-cost infrastructure option.

Recommended Actions:

- Commission a feasibility study and site assessment for the hub model.
- Engage The Salvation Army Thrift Store, NACTR member organizations, and other charitable and for-profit retailers as anchor partners.
- Explore adaptive reuse of transitioning MRF facilities as a lower-cost infrastructure option.
- Conduct a logistics assessment and develop a sustainable operating model that does not depend on continued commodity price recovery.
- Prioritize garment life extension through outlet and pay-by-the-pound retail formats before directing material to downstream sorting and wholesale.

Expected Outcomes:

- Reduced accumulating storage costs and landfill disposal for charitable and independent retailers.
- A functioning aggregation and baling function supplying consistent feedstock to downstream pathways.
- Extended garment life through additional retail channels before material moves downstream.

MKT-2 Develop a Denim Recovery and Insulation Manufacturing Pathway in Two Stages

Priority: High ▲

Audience: Provincial government; Manufacturers; Entrepreneurs; Bioeconomy incubators and accelerators; NACTR

A phased approach lets Nova Scotia validate feedstock quality and commercial demand for denim recycling before committing to capital-intensive manufacturing, reducing investment risk while generating early revenue and the material knowledge needed to design a viable in-province insulation product.

Evidence from TTNS

- A pilot-scale single-rotor shredder suitable for pre-sorted denim feedstock represents an estimated capital investment of approximately $200,000, the most capital-efficient manufacturing entry point identified in this research.
- A current commercial buyer of denim insulation has confirmed active demand for Canadian-sourced recycled denim insulation and has expressed willingness to source domestically.
- This buyer currently incurs unnecessary logistics costs returning offcuts to its US supplier – costs that a domestic supply chain would reduce.
- Existing North American denim insulation manufacturers, including potentially Jasztex and BluePoint, could serve as Stage 1 buyers for specified denim shred.

Recommended Actions:

- Establish denim collection, sorting, and shredding capacity within or adjacent to the Reuse and Sorting Hub (MKT-1).
- Supply specified denim shred of known fibre composition and acceptable elastane content to existing North American insulation manufacturers.
- Pursue a funded Stage 2 pilot with Vestechpro or a similar contract R&D firm to validate product performance, certification requirements, and market pricing.
- Design the Stage 2 pilot in collaboration with the confirmed commercial buyer identified through this research.
- Assess Scientific Research and Experimental Development (SR&ED) tax credit eligibility for Stage 2 product development, and build a business case comparing domestic production costs against the current US supply chain.

Expected Outcomes:

- Early revenue generation that offsets collection and sorting costs.
- Validated feedstock quality and commercial attractiveness ahead of product development investment.
- Established commercial viability of denim insulation manufacturing, supporting future private investment in Nova Scotia.
- A replicable model for broader nonwoven textile applications as the system matures.

MKT-3 Commission a Provincial Textile Capacity and Economic Baseline Study

Priority: High ▲

Audience: Provincial government; NACTR; Divert NS; Researchers

Investment decisions in textile recovery cannot be reliably sized, justified, or sequenced without foundational data on what Nova Scotia's system currently handles and is capable of handling. This is simultaneously a research gap and a policy gap: without it, government cannot evaluate infrastructure proposals, funders cannot assess return on investment, and manufacturers cannot assess feedstock supply reliability.

Evidence from TTNS

- No systematic inventory of collection volumes, processing capacity, or disposal costs currently exists at the provincial level.
- The AFTeR Impact Report *(Genge, 2021)* provides a partial baseline for employment and diversion from 2020 but requires updating and expansion to reflect current conditions and a broader set of organizations.
- Government, funders, and manufacturers each currently lack the data needed to evaluate infrastructure proposals, return on investment, and feedstock supply reliability.

Recommended Actions:

- Quantify collection volumes by organization, including both for-profit and non-profit where possible, and map key material flows between value chain stages.
- Quantify disposal costs incurred by collectors, thrift retailers, and wholesalers, and the economic activity currently generated by the reuse sector.
- Model the economic and employment impacts of the investment scenarios in this report, including job creation, avoided disposal costs, landfill diversion value, and manufacturing output.
- Partner with NACTR, Divert NS, municipal waste authorities, and post-secondary research partners.
- Align the study's methodology with the **TTNS Phase II Waste Characterization** methodology and supporting work, and publicly release findings.

Expected Outcomes:

- A defensible, quantified baseline for sizing and sequencing future textile recovery investment.
- Government, funders, and manufacturers each equipped with the data needed to evaluate proposals and supply reliability.
- An updated, expanded successor to the AFTeR Impact Report reflecting current provincial conditions.

MKT-4 Develop a Provincial Green Procurement Policy for Recycled Textile Content in the Built Environment

Priority: Medium ▲

Audience: Federal and provincial government

Government procurement is one of the most powerful and immediately available demand-side levers available to Nova Scotia. Requiring recycled textile content in government purchases of insulation would directly address the barrier stakeholders cited most frequently: the absence of reliable downstream demand that would justify investment in sorting, processing, and manufacturing infrastructure.

Evidence from TTNS

- Stakeholder interviews conducted for this research most frequently cited the absence of reliable downstream demand as the barrier to investment in sorting, processing, and manufacturing infrastructure.
- Government purchases of thermal and acoustic insulation represent a demand channel that the province directly controls.
- A domestic denim insulation supply chain, supported by this kind of demand signal, is already sought by a confirmed commercial buyer (see **MKT-2**).

Recommended Actions:

- Establish minimum recycled textile content thresholds for insulation products used in government-funded construction and retrofit projects.
- Phase implementation timelines to allow domestic supply capacity to develop before compliance is required.
- Build clear verification and reporting mechanisms, and explicitly recognize Canadian-sourced recycled textile content to support regional industry development.

Expected Outcomes:

- A stable, predictable demand signal for recycled textile content in the built environment.
- A meaningfully changed investment calculus for domestic manufacturers and recyclers.
- Increased viability of in-province denim insulation manufacturing (see **MKT-2**).

MKT-5 Establish a Textile Value Chain Coordination Body and Standardized Data

Priority: Medium ▲

Audience: Divert NS; NACTR; Active industry partners

Nova Scotia's textile recovery system is fragmented in a way that infrastructure investment alone cannot resolve. A coordination function is needed to set common standards, facilitate information exchange, and build the trust and data transparency required for supply relationships between surplus producers and downstream processors to form and persist.

Evidence from TTNS

- No common grading and sorting standards currently exist for donated and surplus textiles across the provincial system.
- No provincial textile material flow tracking framework currently exists that is aligned with other stewardship reporting systems.
- Public reporting on textile volumes placed on the marker, diverted through reuse, and disposed of to landfill would strengthen accountability and support future investment cases, but does not currently exist in a standardized form.

Recommended Actions:

- Establish the coordination function within an existing organization, such as Divert NS, NACTR, or another multi-stakeholder textile working group, rather than a new standalone body.
- Establish common grading and sorting standards for donated and surplus textiles.
- Develop a provincial textile material flow tracking framework aligned with Divert NS or other stewardship body reporting systems.
- Facilitate matchmaking between surplus textile producers and downstream processors.
- Prepare the provincial system for participation in future national EPR and stewardship frameworks.

Expected Outcomes:

- Common grading and sorting standards adopted across the provincial system.
- Stronger supply relationships between surplus producers and downstream processors.
- A provincial system prepared to participate in future national EPR and stewardship frameworks.

MKT-6 Advocate for and Prepare for a Mandatory Provincial Textile Stewardship Program

Priority: Medium ▲

Audience: Federal and provincial government

The long-term viability of most pathways identified in this report depends on shifting the cost of end-of-life textile management upstream to producers and brands. Positioning Nova Scotia as an active, prepared participant in textile stewardship policy now ensures the province can implement a framework immediately and effectively once one becomes viable, rather than starting from scratch.

Evidence from TTNS

- The long-term viability of most pathways identified in this report depends on policy mechanisms that shift end-of-life management costs upstream to producers and brands.
- Other provinces are already exploring stewardship mechanisms, including Ontario's Bill 90 *(McMahon, 2025)*.
- Environment and Climate Change Canada's Zero Plastic Waste agenda provides an existing federal engagement channel for textile stewardship policy.

Recommended Actions:

- Actively participate in federal textile policy consultations, including engagement with ECCC's Zero Plastic Waste agenda.
- Assess the feasibility of an Atlantic textile stewardship pilot in partnership with New Brunswick, Prince Edward Island, and Newfoundland.
- Integrate textile EPR readiness and textile waste reduction goals into Nova Scotia's existing sustainability goals.
- Advocate for EPR design that protects and builds on existing textile reuse infrastructure rather than displacing it.
- Develop the data frameworks, coordination capacity, and pilot infrastructure described in **MKT-1 through 5** ahead of framework implementation.

Expected Outcomes:

- A sustainable funding mechanism for collection, sorting, and recycling infrastructure at scale.
- Nova Scotia positioned to participate immediately and effectively once a stewardship framework is implemented.
- Upstream design improvements, including simpler monofibre construction, safer chemical inputs, and material traceability, driven by producer obligations.

6.1 Limitations

Several limitations should be considered when interpreting the findings of this report.

Textile markets are dynamic and may shift in response to changes in commodity prices, trade policies, transportation costs, consumer demand, and regulatory requirements. The market conditions, opportunities, and constraints identified here may therefore evolve over time.

While interviews were conducted with a diverse range of stakeholders from across the textile value chain, the findings necessarily reflect the perspectives and experiences of participating organizations.

Representation from end-market purchasers was particularly limited, as many organizations considered customer relationships and purchasing arrangements to be commercially sensitive.

Although recurring themes were corroborated across multiple interviews and desktop research, the results may not capture all viewpoints within the sector.

A significant limitation of this report is the absence of Nova Scotia-specific data needed to support meaningful economic modelling. System-wide tonnage data, organizational disposal costs, and processing volumes are not collected or reported consistently at the provincial level. As a result, this report does not include projections of job creation, landfill diversion value, or manufacturing output associated with the investments it recommends. Any such estimates would have required assumptions and extrapolations of a scale that would undermine their reliability. Commissioning the baseline study recommended in Recommendation **MKT-3** is the necessary precondition for this kind of modelling.

Finally, the pathway assessments are intended to identify promising areas for future investment rather than provide detailed implementation plans. Cost estimates for equipment, infrastructure, and processing systems should be interpreted as indicative ranges only, as actual costs will vary depending on scale, technology selection, facility requirements, location, and market conditions. Further feasibility studies, pilot projects, and business case development would be required before any specific investment is made.



Limitations and Mitigations Summary

Textile markets are dynamic and may evolve over time
Continuing studies will be necessary to reflect the status quo as it shifts.

Interview findings reflect the perspectives and experiences of participants
Interviews were conducted with a diverse range of stakeholders, but findings are necessarily subjective.

Representation from end-market purchasers was limited
Incentives may be required for organizations to provide information they consider commercially sensitive.

Results may not capture all viewpoints within the sector
Future studies should continue to capture as many diverse perspectives as possible.

Nova Scotia-specific data is limited
Commissioning the baseline study recommended in MKT-3 is the necessary precondition for this modelling.

Pathway assessments are not intended to provide detailed implementation plans
Further feasibility studies, pilot projects, and business case developments would provide more information.

7.0 Conclusion

Nova Scotia has reached a critical point in the management of post-consumer textiles. The downstream disruption affecting charitable retailers demonstrates that the province's long-standing reliance on export markets is increasingly unstable and insufficient. At the same time, this research shows that much of the material accumulating in storage areas and landfills retain significant value. Some garments remain suitable for reuse, while others could serve as feedstock for insulation, nonwovens, soil amendments, and other domestic applications.

Capturing this value will require coordinated investment in collection, sorting, preprocessing, manufacturing capacity, market development, and supportive policy frameworks. Nova Scotia already has established collection and reuse networks, research expertise, available policy tools, and confirmed interest from potential end users. The next step is to translate these assets into an integrated textile recovery system. The recommendations presented in this report provide a foundation for sustained collaboration, investment, and implementation.

This project was undertaken with the financial support of:
Ce projet a été réalisé avec l'appui financier de :

Environment and Climate Change Canada | Environnement et Changement climatique Canada

Textile Transformation Nova Scotia Phase II

0 Master Report

1 Waste Characterization Study

2 Donation Etiquette Analysis

3 End-Use Pathways Brief

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