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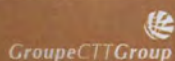


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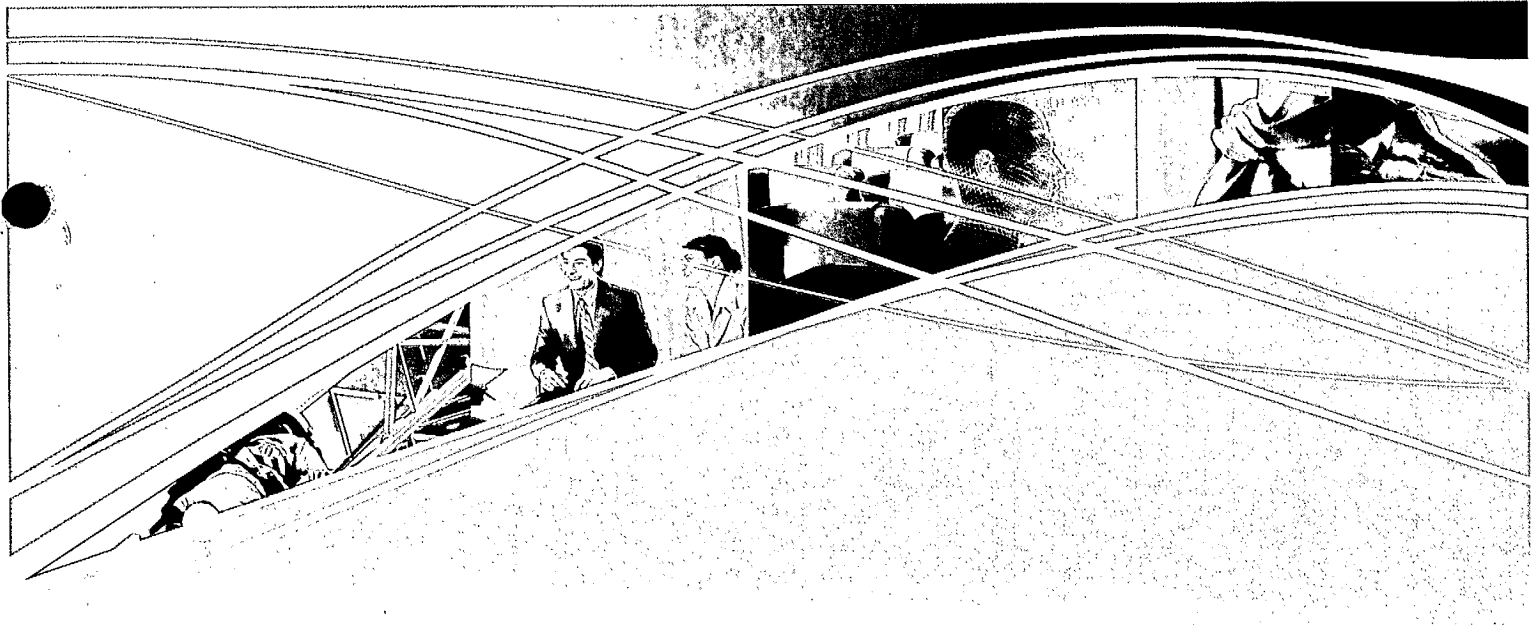
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TEXTILE INDUSTRY

Innovation through Partnership

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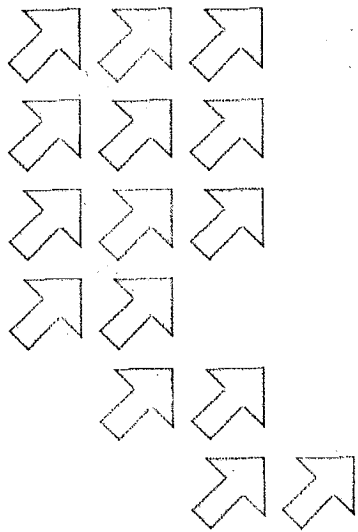
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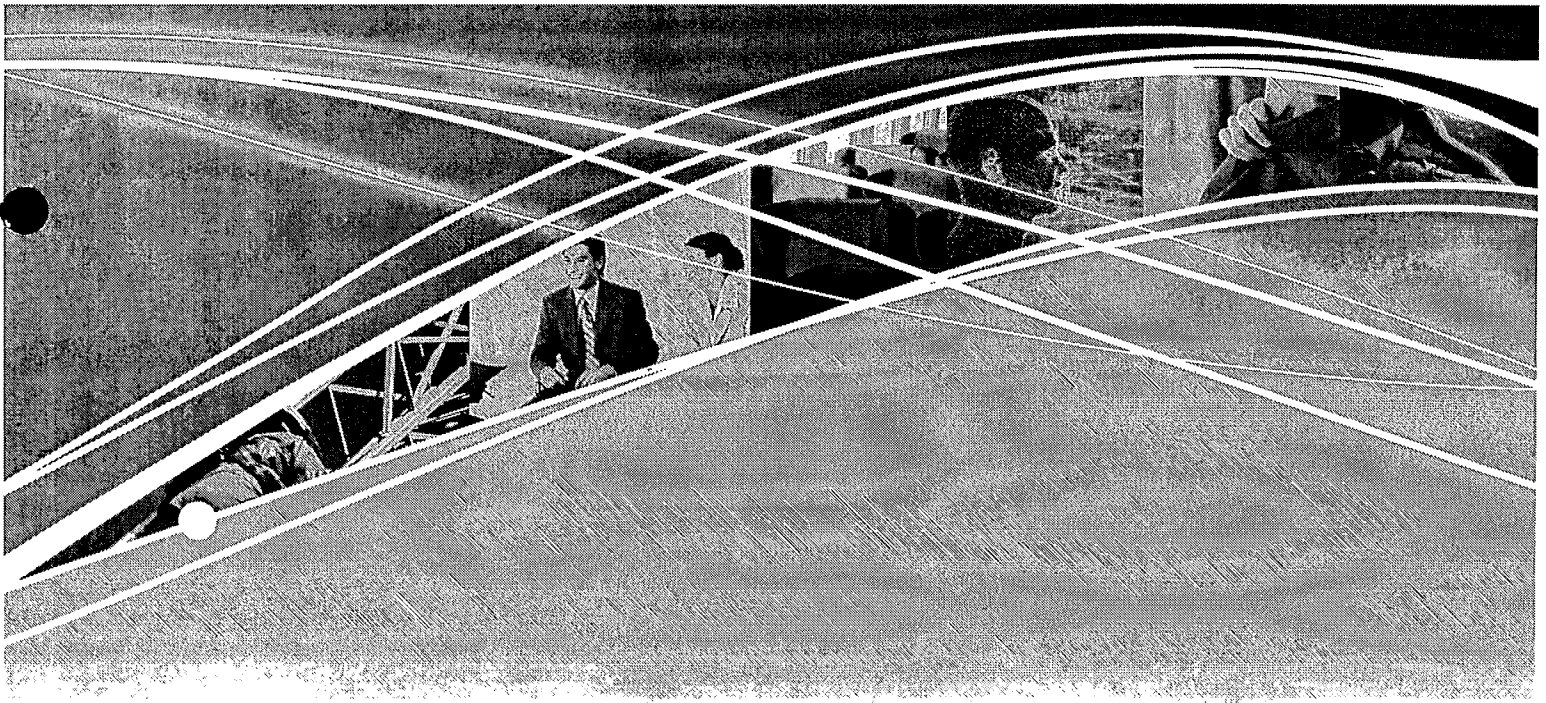

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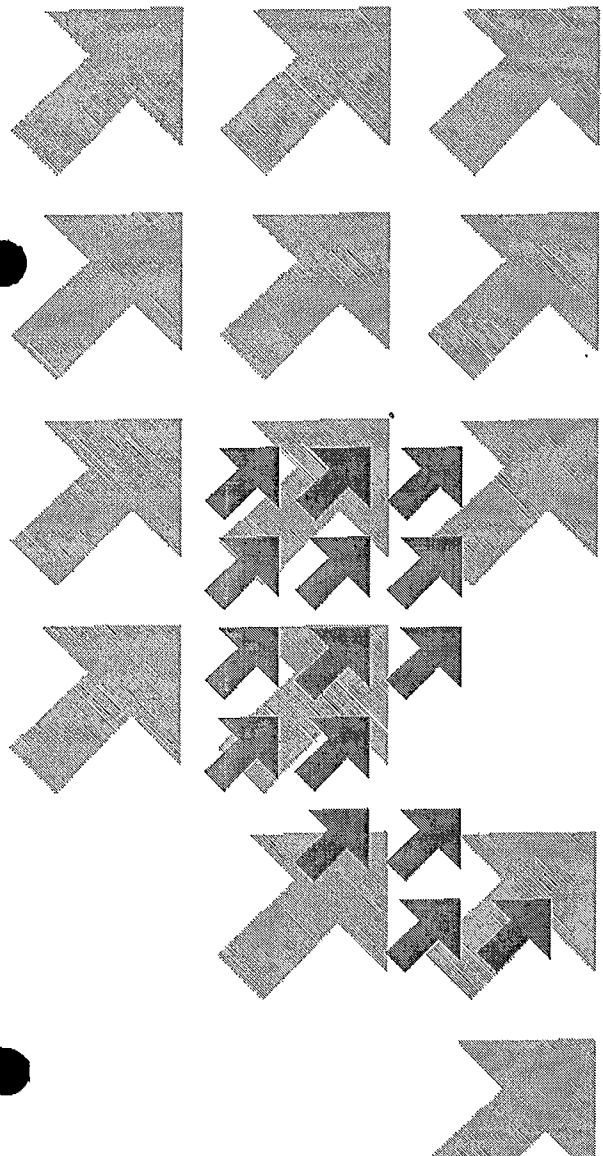
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FOR THE CANADIAN
TEXTILE INDUSTRY

*Innovation through
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TABLE OF CONTENTS

ACKNOWLEDGMENTS	2
SUMMARY	7
Recommendations	8
<i>Organization</i>	8
<i>Innovation</i>	9
<i>Human Resources</i>	10
<i>Partnerships</i>	10
<i>Communication and Image</i>	12
FOREWORD	13
INTRODUCTION	15
Definition of a Technology Roadmap	15
Objective and Scope of the Textile Industry's Technology Roadmap	15
Methodology	17
<i>Phase 1 – Preparatory Stages</i>	17
<i>Phase 2 – Industry Consultation</i>	18
<i>Phase 3 – Development of the Roadmap and Approval of Preliminary Conclusions</i>	19
<i>Phase 4 – Communication of the Roadmap</i>	20
1. PROFILE OF THE TEXTILE INDUSTRY IN CANADA	21
1.1 Textile Market	24
1.2 Technical Usage Textiles Market (TUT)	28
1.3 Market for Other Value-Added Textiles (OVAT)	30
1.4 Present and Future Users of Technical Textiles	32
1.5 Technical Textile Market Trends	32
1.5.1 <i>Competitive Constraints</i>	37
1.6 Key Success Factors	40
1.7 Strengths, Weaknesses, Threats and Opportunities	43
1.8 Challenges	44
2. THE CANADIAN TEXTILE INDUSTRY'S VISION	45
2.1 Manufacturers' Vision	45
2.2 Demand Factors	46
2.2.1 <i>High-Priority Demand Factors</i>	47

2.2.2	<i>Other Demand Factors</i>	49
2.2.3	<i>Identifying Barriers to Market Demand</i>	49
2.2.4	<i>Growth Markets</i>	51
2.3	The Industry's Vision and the Shortfalls to Overcome (Success Factors).....	54
3.	NEEDS AND PREREQUISITES	55
3.1	Targeted and Prerequisite Technological Opportunities	55
3.2	Products' Desired Critical Characteristics and Functionalities	64
3.3	Existing Technological Capacities	65
3.3.1	<i>Traditional Technologies</i>	65
3.3.2	<i>New Technologies</i>	66
3.4	Shortfalls and Obstacles.....	69
4.	TECHNOLOGY AND OTHER SUCCESS FACTORS.....	71
4.1	Evaluation and Ranking of Technologies.....	71
4.2	Recommended Technologies	72
4.3	Decision Factors and Time Frame for Technological Development.....	72
4.4	Other Success Factors.....	73
4.4.1	<i>Human Resources</i>	73
4.4.2	<i>Production</i>	75
4.4.3	<i>Commercialization</i>	76
4.4.4	<i>Finance</i>	77
4.4.5	<i>R&D</i>	79
4.4.6	<i>External Factors (Government Support Policy, International Trade Policy)</i>	80
5.	STRATEGIC OBSERVATIONS	83
6.	RECOMMENDATIONS	87
	<i>Organization</i>	87
	<i>Innovation</i>	88
	<i>Human Resources</i>	89
	<i>Partnerships</i>	89
	<i>Communication and Image</i>	91
	CONCLUSION	93
	BIBLIOGRAPHY	95



List of Figures

FIGURE 1.	ROADMAP DELIVERABLES.....	17
FIGURE 2.	WORKSHOP STRUCTURE	19
FIGURE 3.	TEXTILE INDUSTRY NETWORKS	22
FIGURE 4.	TEXTILE INDUSTRY OPPORTUNITIES	23
FIGURE 5.	EVOLUTION OF THE TEXTILE MARKET IN CANADA 1990-2005 (IN MILLIONS OF DOLLARS)	25
FIGURE 6.	DISTRIBUTION OF TEXTILE PRODUCTION BY DELIVERY VOLUME (2005)..	26
FIGURE 7.	DISTRIBUTION OF APPLICATION SECTORS	34
FIGURE 8.	LEVEL OF TECHNOLOGICAL DEVELOPMENT, BY COUNTRY	37
FIGURE 9.	INDUSTRY'S VISION	45
FIGURE 10.	THE SIX KEY MARKET DEMAND FACTORS	47
FIGURE 11.	GROWTH MARKETS	51
FIGURE 12.	RANKING OF TECHNOLOGIES.....	71

List of Tables

TABLE 1.	DISTRIBUTION OF COMPANIES BY INDUSTRY SECTOR AND PROVINCE ..	26
TABLE 2.	SURVEY OF COMPANIES, BY PRODUCTION TYPE	27
TABLE 3.	TUT FIELDS OF APPLICATION	29
TABLE 4.	OTHER VALUE-ADDED TEXTILES (OVAT) SECTORS	30-31
TABLE 5.	PRINCIPAL USERS.....	33
TABLE 6.	ESTIMATED GROWTH RATES.....	34
TABLE 7.	POSITIONING OF MAJOR PRODUCERS, BY COUNTRY.....	38-39
TABLE 8.	KEY SUCCESS FACTORS FOR THE TEXTILE INDUSTRY, BY SUB-SECTOR	40-41
TABLE 9.	KEY SUCCESS FACTORS FOR THE TEXTILE INDUSTRY, BY SUB-SECTOR	42
TABLE 10.	DEMAND FACTORS	46
TABLE 11.	EXAMPLES OF TEXTILE TECHNOLOGIES IN CANADA, 2008-2018 ..	52-53
TABLE 12.	AGING OF THE POPULATION	56
TABLE 13.	GOVERNMENT PURCHASES AND SUPPORT	57-58
TABLE 14.	POPULATION INCREASE (INCLUDING INCREASED PURCHASING POWER)..	59
TABLE 15.	ENVIRONMENT AND SUSTAINABLE DEVELOPMENT	60-61
TABLE 16.	GEOPOLITICS.....	62

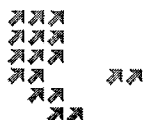


TABLE 17. REGULATION AND TRADE AGREEMENTS 63

TABLE 18. PRODUCT CHARACTERISTICS AND/OR SPECIALTIES BASED ON
MARKET FACTORS AND GROWTH SECTORS 64



SUMMARY

Throughout the past decade, the Canadian textile industry was able to achieve optimal deliveries to the domestic and US markets whilst reducing its ecological footprint. This was thanks to own capabilities (productivity, diversified technologies) and a favourable trade context (NAFTA, the Canadian dollar). However, this situation has been deteriorated by dollar-parity, the abolition of import quotas combined with the US's near-unilateral establishment of new trade regulations, and reduced control over products entering our territory. These changes caused the Canadian textile industry to lose its competitiveness, particularly in mass markets.

The industry has been conducting a planning exercise over these last months. Known as the Technology Roadmap, this document has enabled the industry to determine its future positioning. Specialised products (technical textiles and other value-added textiles) should be targeted, taking into account the various forces that will drive demand for years to come. Demography, geopolitics, environmental concerns, trade and government partnerships are issues to be considered. This product-focus requires implementing, improving and combining existing technologies in the first instance whilst also ensuring on-going evaluation of emerging technologies that will provide added value for the product or the customer (woven, knitted and non-woven composite and hybrid technologies, intelligent technologies, technologies related to non-wovens, high-performance fibres and fabrics, nanotechnologies and biotechnologies). This focus will enable the industry to meet and stimulate tomorrow's consumer demands for products that meet special requirements and offer heightened performance.

Several new leaders have already successfully remodelled their operations along these lines. Preliminary studies conducted concurrently with the Roadmap show that of the 241 Canadian companies active in the value-added and technical textile sectors, 118 were so exclusively. Of the twelve TUT application sectors, five were particularly significant in terms of the number of companies active in them. They are PROTECH, INDUTECH, BUILDTECH, MOBILTECH and MEDTECH.

To ensure widespread adoption of this position, the industry proposes a local concentration of the strengths of the entire value chain. This is to be achieved through the utilization of scientific and technical resources, and the implementation of dynamic R&D cooperation platforms, innovation, commercialization and business networking. These platforms will offer intelligence, leadership and proactive processes. This initiative will

enable the industry to compete with its true rivals (who are overseas) and to develop a critical mass that will interest major public and private clients and group them around structuring projects.

Taking the necessary steps to restore the sector's image in the eyes of the public and the business and financial communities will give the textile industry and its members a reason to implement clear and effective promotion strategies and brands. The industry should also ensure it has the support of legislators in order to fully benefit from international trade policies through fair and legitimate access to domestic and international markets alike.

Recommendations

The industry intends to "innovate through partnership." On the basis of the major planning work it has already performed, the industry has prepared a number of recommendations and an action plan that will set out the guidelines for achieving this new positioning.

Considering the urgency and importance of acting, and to ensure prompt implementation of the plan, the Steering Committee recommends that top priority be given to implementing a permanent committee responsible for the implementation of the recommendations, the action plan, the communication plan and follow-up of the various projects.

The Steering Committee recommends:

Organization

Recommendation 1: Permanence of the Technology Roadmap for the Canadian Textile Industry

SHORT TERM: 2008-2009	MEDIUM TERM: 2009-2012	LONG TERM: 2012-2018
Set up a representative and effective structure, meeting industry and lender expectations, that achieves the action plan, promotes it and serves as a sponsor.	Present a progress report and updated action plan to the industry.	Update the Technology Roadmap for the Canadian Textile Industry.

Innovation

Recommendation 2: Support the industry's shift from mass production to design, development and commercialization of specialized products

SHORT TERM: 2008-2009	MEDIUM TERM: 2009-2012	LONG TERM: 2012-2018
Develop a strategy to support growth-promising industrial initiatives aimed at developing R&D, innovation and commercialization networks in partnership with universities, users and sectoral associations.	Gain national recognition for the structure as a management interface for the textile innovation fund, and management of a first three-year investment program.	Commercialize technologies and products developed in these consortium projects in international markets.
Launch and establish structuring projects locally, involving a number of companies, in growth markets.	Develop a system of technology intelligence and information collection on new and emerging technologies.	Manage a second program (five-year, in this case) of textile innovation fund investments.

Recommendation 3: Profit from driving forces to develop leader products for tomorrow's markets

SHORT TERM: 2008-2009	MEDIUM TERM: 2009-2012	LONG TERM: 2012-2018
Study the evolution of needs in markets served.	Regularly contribute innovation products to markets to satisfy the demands of target populations.	Require prime contractors and government to provide purchasing contracts that include equitable specifications targeting sustainable development.
Establish a strategy that supports growth-promising industrial initiatives aimed at the emerging markets of geopolitical development and sustainable development.	Implement the strategy developed and promote it in terms of technology to contractors and users.	



Human Resources

Recommendation 4: Secure the presence of qualified human resources that meet new industry needs

SHORT TERM: 2008-2009	MEDIUM TERM: 2009-2012	LONG TERM: 2012-2018
Redefine the human resources vision and textile education and continuing education models.	Ensure the training offer that responds to needs is available and used.	Revise training offer compliance in accordance with needs.

Partnerships

Recommendation 5: Know ourselves better to establish partnerships

SHORT TERM: 2008-2009	MEDIUM TERM: 2009-2012	LONG TERM: 2012-2018
Develop a detailed technological profile of the Canadian textile industry.	Update the directory and ensure it is distributed.	Update the directory and ensure it is distributed.
Create networking groups that encourage business partnerships between manufacturers.	Maintain networking groups.	Maintain networking groups.
Develop a virtual discussion forum to encourage information exchanges and provide centralized access to all industry-directed programs.	Secure self-financing for the virtual discussion forum and continually update information.	Secure self-financing for the virtual discussion forum and continually update information.
	Encourage formation of industry groups to facilitate purchasing and marketing synergies.	

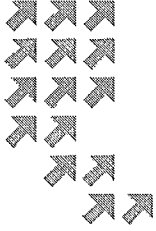
Recommendation 6: Position ourselves to join growth markets and internal and export markets

SHORT TERM: 2008-2009	MEDIUM TERM: 2009-2012	LONG TERM: 2012-2018
Create networking groups and events that encourage partnerships throughout the value chain (material and technology suppliers, processors and clothing manufacturers, buyers, prime contractors, legislators and specifiers) in growth markets.	Maintain networking groups and events around themes of common interest.	Gain recognition as high-quality players from at least two networking groups in industrial sectors serving growth markets.
Develop a strategy to address trade regulations that restrict domestic companies' import/export development, and set up facilitating mechanisms in their place.	Implement strategy and maintain ongoing dialogue with legislators (lobbying).	Ensure there is ongoing dialogue with legislators to support the long-term survival of the Canadian textile industry.
Develop a local purchasing policy to support textile sector development, taking into account the restrictions imposed by NAFTA.	Activate the local purchasing policy.	Consolidate the local purchasing policy.
Ensure that structuring initiatives for export market development are continued, e.g. Team Textile Canada, TCBC Shanghai and more.	Analyze the feasibility of developing business export offices for the Canadian textile industry in strategic markets (US, India, Brazil, etc.).	Secure the long-term survival of business export offices.



Communication and Image

Recommendation 7: Make ourselves known and recognize our true value



SHORT TERM: 2008-2009	MEDIUM TERM: 2009-2012	LONG TERM: 2012-2018
Develop and implement a Technology Roadmap communication plan.	Adjust and modify the Technology Roadmap communication plan.	Adjust and modify the Technology Roadmap communication plan.
End reflection on an appropriate image for the Canadian textile industry (e.g. "nordicity," "Made in Canada," "Canadian quality").	Provide the industry with a brand image that reflects its distinctiveness and is recognized throughout Canada.	Provide the industry with a brand image that reflects its distinctiveness and is recognized internationally.



FOREWORD

The Canadian textile industry numbers over 400 companies, concentrated mainly in Québec and Ontario. Textile production was valued at \$6.2 billion in 2005. The sector employs over 40,000 people and paid out over \$1.6 billion in salaries in 2003.

Globalization and trade agreements have rocked the foundations of the world economy, forcing the Canadian textile industry to embark on a major restructuring of its offer. Previously directed at mass markets, Canadian manufacturers have had to contend for some time now with imports from countries with lower labour costs. They must therefore concentrate on finding new product and technology niches that will support their new developments.

In the face of an increasingly significant competitive dynamic and of a currency that favours equipment acquisition over product export, Canadian industry must stand out from the competition by investing in its strengths (rapid performance, adaptability and process improvement) and turning to value-added markets.

In this context of renewal, the Canadian textile industry has taken the initiative to found its future development on a structured process, namely by developing a roadmap specific to the sector and its distinctive features.

INTRODUCTION

Definition of a Technology Roadmap

A Technology Roadmap (TRM) is an evaluation and planning exercise aimed at developing innovative products and processes to meet the market's new requirements. It gives the industry a dynamic level of competitiveness and, even better, worldwide distinction.

Industry-led, a Roadmap's goals are to:

- Provide the industry with a common vision.
- Forecast development of products that will be in demand.
- Develop a timeline (2-, 5- and 10-year perspectives).
- Identify crucial or emerging technologies that offer the industry the possibility of gaining a competitive advantage over its global competitors.
- Identify success factors (resources, time, investment, etc.) and prioritize technologies most likely to meet desired objectives.

Over the past 15 years, a number of industry sectors around the world have developed similar tools to plan their industries' futures.

In Canada, a number of major industries have performed the exercise, including: aircraft, aluminium, "smart" building, lumber and associated value-added products, electrical energy, and fuel cell, in addition to many others. Nearly 30 Roadmaps have been initiated in Canada to support industries in their vision to utilize business development opportunities.

Objective and Scope of the Textile Industry's Technology Roadmap

The sector has been adopting a technological and commercial development strategy in response to the new economic realities that have forced such spectacular changes on Canadian textile industries. A quest for new technologies and new skills acquisition is in order.

Many companies possess few of the resources and skills necessary for innovation and will be increasingly pushed to evaluate other development alternatives for their companies, in terms of R&D, human resources and purchasing.

The objective sought by this strategy, formally known as the Technology Roadmap for the Canadian Textile Industry ("Roadmap" or TRM) is defined as follows:

To provide the Canadian textile industry with a vision of technological development and to initiate consultation with all stakeholders in the textile network to position the industry decisively on the world stage.

With the input of an advisory committee (made up of industry stakeholders), the Roadmap steering committee (composed of 10 manufacturers and 2 industry members) has established the foundations for the exercise and identified the various partners likely to make constructive contributions to the Roadmap.

Participation in the Roadmap development process can be summarized as follows:

Participants

- 70 people directly from industry ranks
- 50 industry partners

Activities

- 5 Roadmap meetings
- 8 steering committee meetings
- 25 consortium meetings
- 11 workshops
- 1 survey of all workshop participants to retrieve additional information
- 14 subcommittee meetings



Methodology

The Canadian Technology Roadmap for the textile industry was executed over an 11-month period.

The process consisted of four distinct stages: the preparatory stage, industry consultation through workshops, and development and communication of the Roadmap.

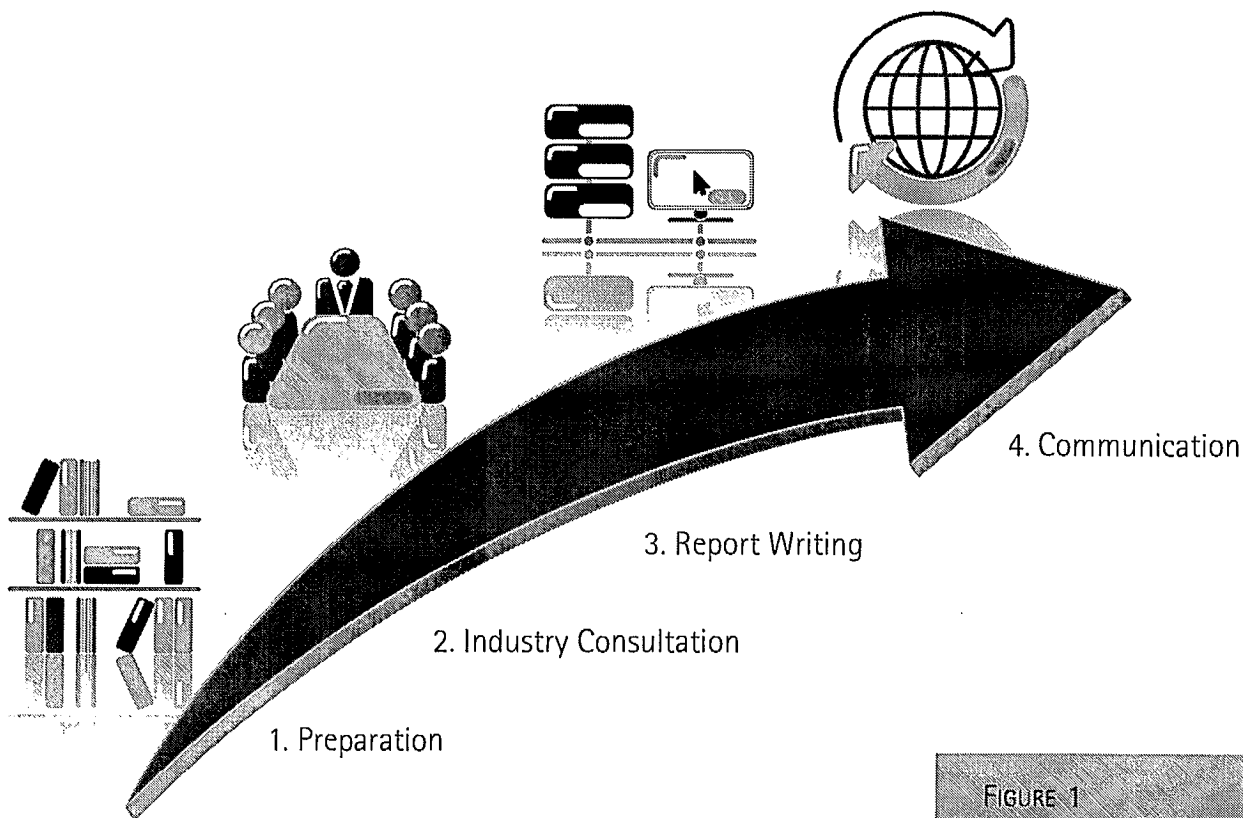
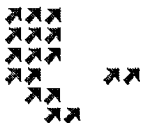


FIGURE 1
Roadmap Deliverables

Phase 1 – Preparatory Stages

- Realization of preliminary studies led and carried out by CTT Group
 - ➔ *Sectorial profile of the Technical Usage Textile (TUT) industry*
 - ➔ *Market study of present and future users of TUT and Other value-added textiles (OVAT)*



- ➔ Detailed survey of Technical Usage Textiles (TUT) and other value-added textiles (OVAT) in Canada
- ➔ Study of new opportunities in traditional internal markets
- Formation of a steering committee composed of 12 industry representatives accompanied by an advisory committee of nine stakeholders
- Development of cost estimates and requests for financing presented to *Industry Canada*, the *Ministère du Développement Économique de l'Innovation et de l'Exportation du Québec* (MDEIE), *Canada Economic Development* (CED) and the *Ontario Ministry of Economic Development and Trade*
- Tendering process for hiring an external company to accompany the process

Phase 2 – Industry Consultation

To respond appropriately to industry needs, the Roadmap process included various consultations carried out over a seven-month period. Consultations were conducted in the form of theme-based workshops and working subcommittees.

Workshops

To rally sector members and prompt industry to strategize, three (3) groups of workshops took place from September 2007 to December 2007 based on the following themes:

Workshop 1	Identification of future markets and products
Workshop 2	Survey of technologies that will support prospective markets and opportunities for product development
Workshop 3	Key success factors
Workshop 4	Preliminary conclusions and recommendations of the Roadmap



To reach the maximum number of participants in their own language, each workshop comprised three meetings (one each in French and English in Québec and one in English in Ontario). Over 120 different participants took part in the consultation sessions.

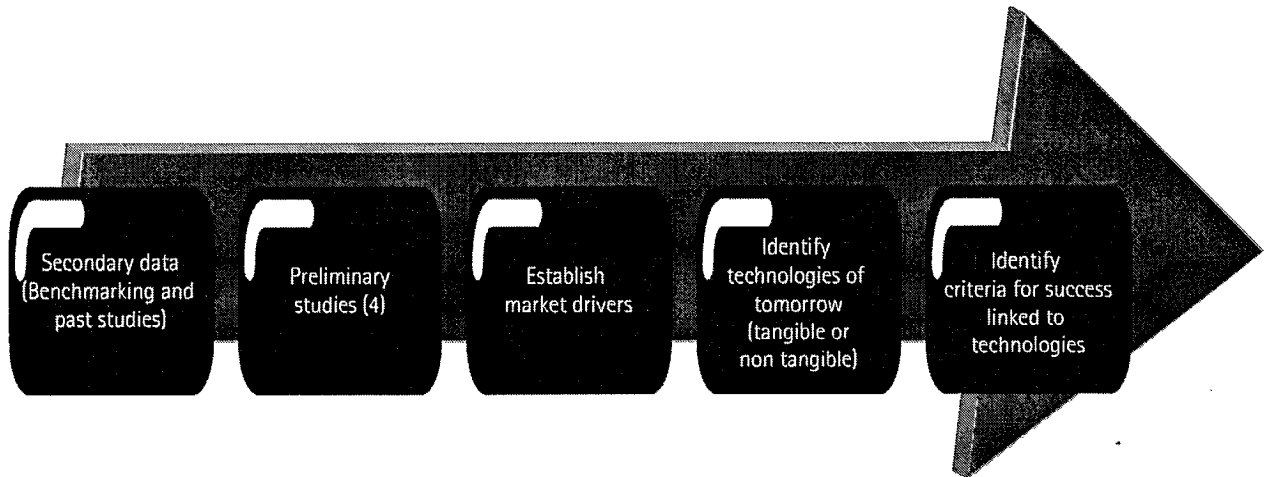


FIGURE 2
Workshop Structure

Working Subcommittees

To supplement the workshop consultations, CTT Group invited interested partners to refine the ideas that had been discussed over the preceding months. Four groups were assembled in the form of subcommittees:

- Technology
- Finance
- Human resources
- Policy

The committees met two or three times to confirm and complete the major principles of the Roadmap.

Phase 3 – Development of the Roadmap and Approval of Preliminary Conclusions

Using information collected in the various workshops and subcommittees, the consortium proceeded to write this report.



The report was summarized and submitted to manufacturers and industry partners for comments and approval in *Workshop 4* (March 2008).

Phase 4 – Communication of the Roadmap

To publicize the new *Technology Roadmap for the Canadian Textile Industry*, a communication plan was drawn up to ensure objectives set by the industry were achieved. This fourth and last phase is intended to broaden the Roadmap's scope and to stimulate interest for innovations throughout the industry. This will be achieved with tools such as promotional and information campaigns and targeted conferences.



1. PROFILE OF THE TEXTILE INDUSTRY IN CANADA

The textile industry is one of the oldest industry sectors in Canada, and the most widespread industry in the world. Textiles can be found in a wide range of forms—in the clothing industry, naturally, but also in sectors such as transportation, health (medical), agriculture, civil engineering, packaging, protection (individual, environmental), and building.

Textile companies perform three main types of activity, namely:

Yarn spinning

- Spinning of staple fibres into industrial and commercial yarns
- Texturing or throwing of chemical-based filament yarns (artificial and synthetic)
- Manufacturing of thread for crafts, embroidery, sewing and more

Fabric manufacturing

- Woven fabric
- Nonwoven fabric
- Knit fabric

Finishing or dressing, and coating of fabrics and textiles

- Textile ennobling
- Coating of fabrics (laminating, coating, bonding, etc.).

Companies are part of a textile network structured on four levels. The sector's upstream activities include producers of natural and synthetic fibres, associated with the chemical, agricultural, livestock production and mineral industries. Downstream, the industry is linked with companies associated with clothing, upholstered furniture, household items, floor coverings and industrial applications (both simple and complex). Finally, the industry is indirectly connected to wholesalers, retailers and consumers.

Figure 3 on the next page shows the textile network and its various branches.

Figure 4, on page 23, indicates the main industry opportunities.

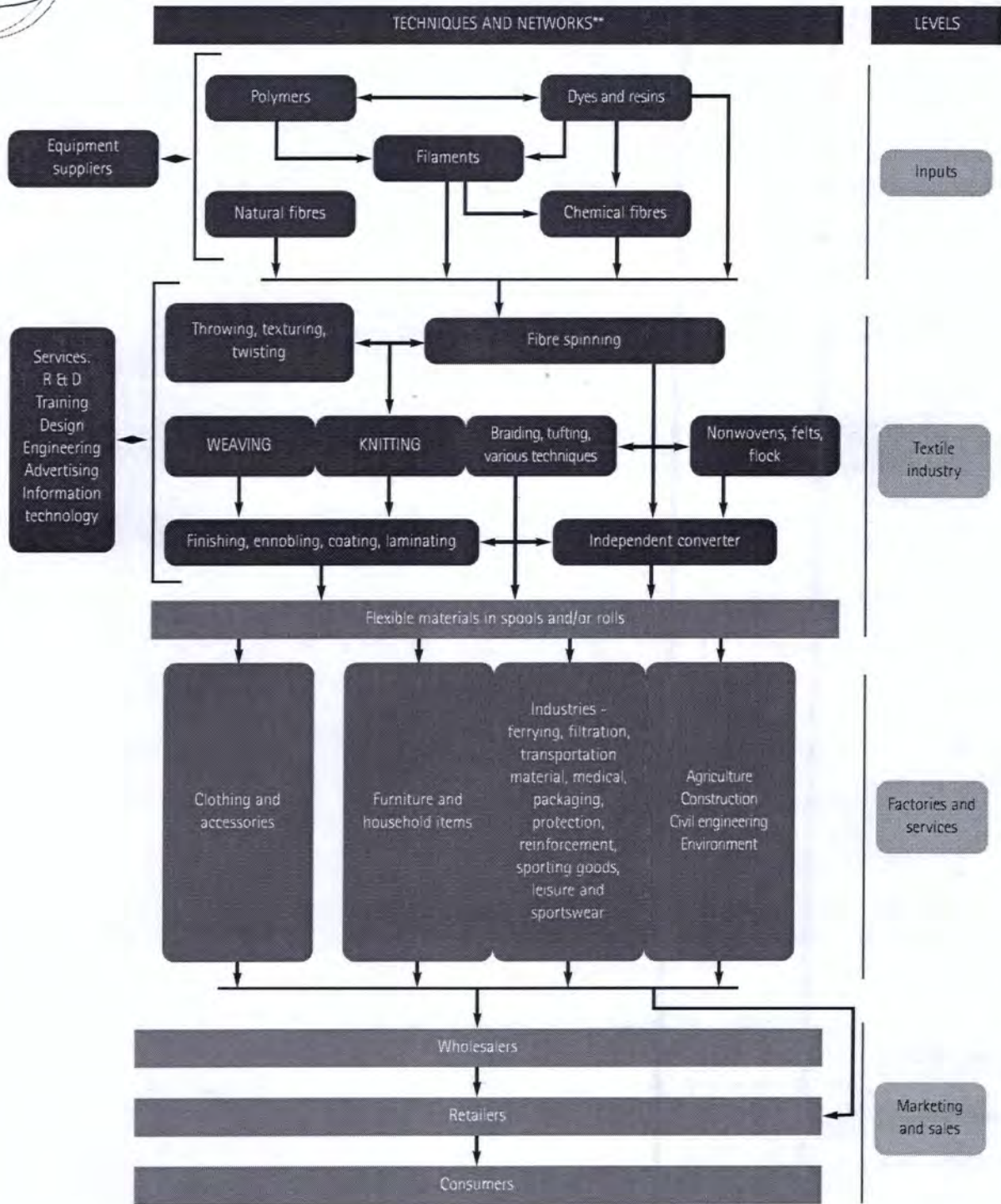
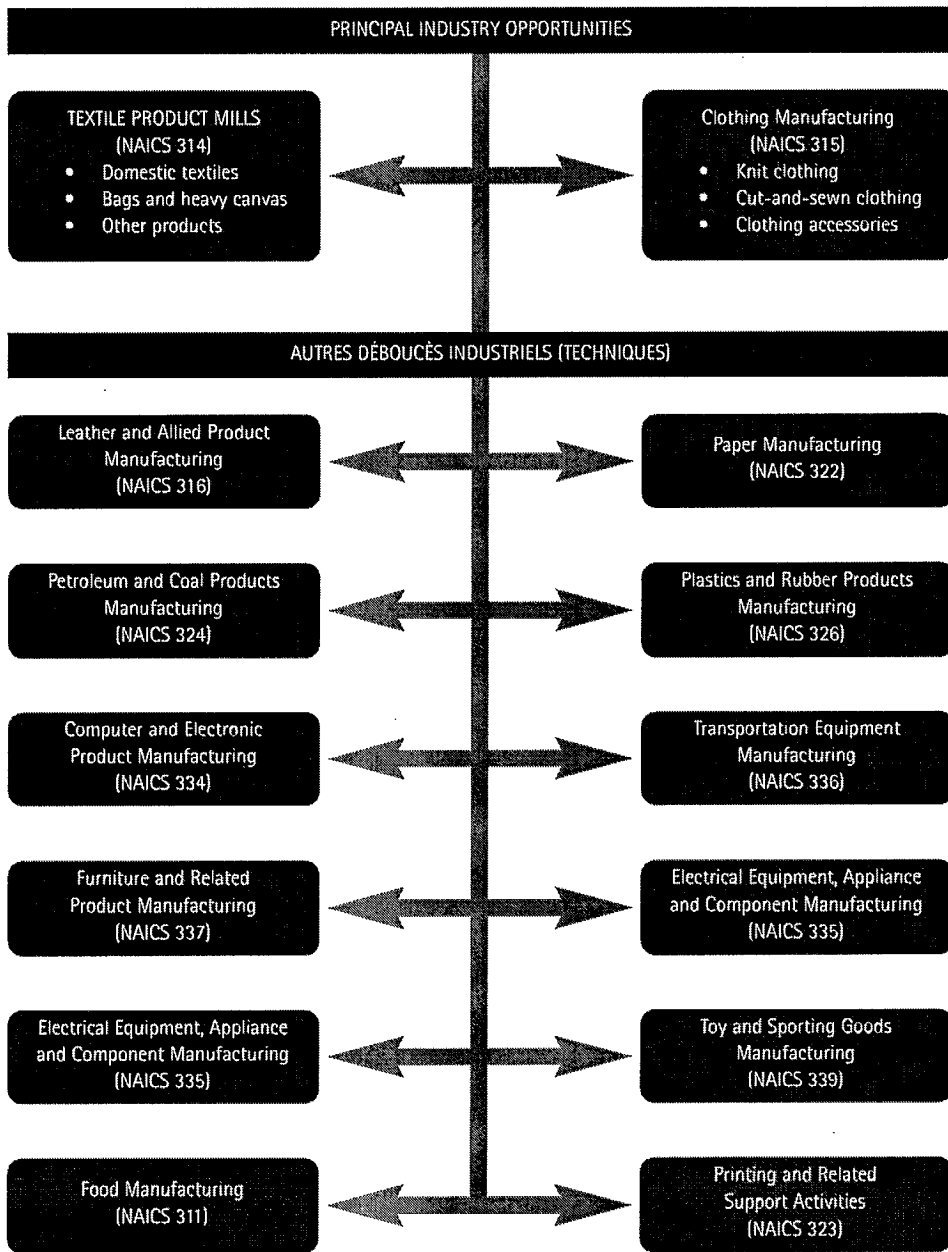


FIGURE 3
Textile Industry
Networks

* The converter buys threads and fabrics and has them produced and/or ennobled by sub-contractors.
 ** Categories of materials and products can flow directly to lower levels.
 Source : Direction générale de l'industrie et du commerce, *La filière industrielle des textiles au Québec*, December 2003.

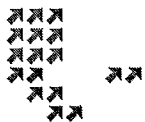




Source: Comité sectoriel de l'industrie textile du Québec – Diagnostic provincial pour le secteur textile!

FIGURE 4
Textile Industry Opportunities

1. Compiled by Bell Nordic/ IPSE - 2003.



The industry's links with goods and service providers, such as equipment manufacturers, R&D, training, design, engineering, advertising, and information technology are not to be overlooked.

As stated above, textile applications are countless and are used in a wide range of manufacturing activities.

1.1 Textile Market

All categories combined, the textile sector is estimated at \$120 billion worldwide.² Consumption forecasts for 2010 have been valued at 22 million tons, representing a world market of \$140 billion. Of this, the Asian market controls 8.5 million tons, the North American, 5.8 million tons, and the European, 4.8 million tons.³

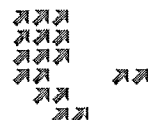
According to the Canadian Textile Institute (CTI)⁴, total textile production in Canada in 2006 was estimated at \$5.7 billion. The industry remains a major employer in Canada, accounting for over 40,000 jobs. Textile manufacturers invested over \$4 billion from 1996 to 2005.

Canadian textile exports in 2006 were in the order of \$2.7 billion, representing the 6th largest export industry of Canada. Nearly 82% of exports were destined for the United States. Asia, Europe and South America received most of the remainder.

According to the CTI,⁵ as of 2000 the Canadian textile industry posted one of the highest innovation intensity rates at 85.8%, compared to 80.2% for industries as a whole. Canadian research and development activities significantly outstripped those of the United States, measuring in at 1.3 against 0.5 for the United States.

Figure 5 on the following page shows the Canadian textile market's development across 1990-2005, in terms of delivery, exports, domestic deliveries, imports and the total market.

-
2. Data from 2005.
 3. Source: Groupe CTI - *Études des marchés utilisateurs actuels et futurs des TUT et ATVA.*
 4. Source: CTI - *Canada's textile industry... An Overview.*
 5. Source: ITC - *Idem.*



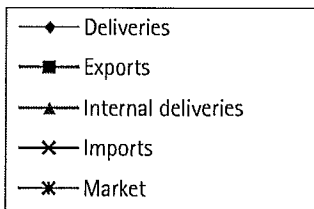
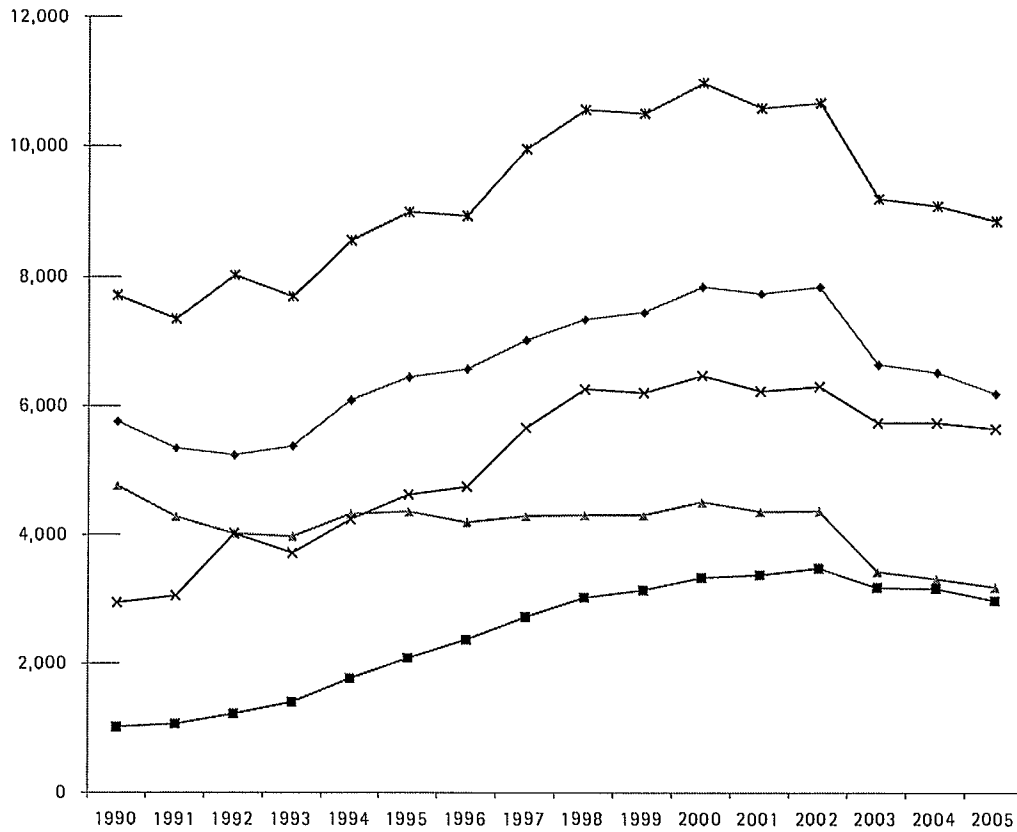


FIGURE 5
Evolution of the
Textile Market in
Canada 1990-2005 (in
millions of dollars)

In 2005,⁶ Canada's textile market was valued at \$8.8478 billion. Production by companies amounted to \$6.197 billion. Internal deliveries were valued at \$3.204 billion, and imports totalled \$5.6438 billion. Exports counted for \$2.993 billion.

As mentioned above, the textile markets possesses three major niches:

- Fibres
- Textile products
- Textile mills

6. Source: Apparel and Textile Branch (SICPB), and data from Statistics Canada.

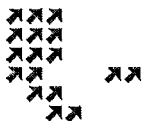


FIGURE 6
Distribution of Textile
Production by Delivery
Volume (2005)

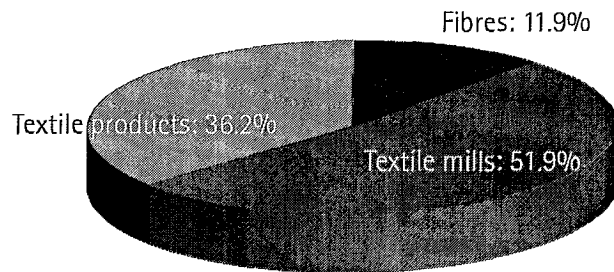


Table 1. Distribution of Companies by Industry Sector and Province

REGION	APPAREL	CARPETS	HOME FURNISH.	TUT + OVAT	EXCLUSIVE ⁷	TOTAL
Québec	140	16	61	126	46	251
Ontario	53	14	29	79	45	129
Western Canada	9	4	6	21	15	30
Atlantic Canada	2	2	1	15	12	18
Total	204	36	97	241	118	428

7. "Exclusive" meaning these companies do not serve other markets (apparel, carpets and home furnishings).

8. Source: Vermeersch and Mlynarek, "Detailed survey of TUT and VAT companies in Canada", CTT Group, March 2007.

According to the CTT Group study,⁸ 428 companies were active in textile materials production in Canada: 251 in Québec (59%), 129 in Ontario (30%), 30 in Western Canada (7%) and 18 in the Atlantic provinces (4%).

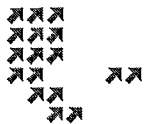
Companies are classified by sector: apparel (47.6%), carpets (8.4%), home furnishings (22.7%), technical textiles (TUT) (56.3%) and other value-added textiles (OVAT) at 27.6%. Table 2 shows distribution of companies by industry sector and province.

The textile sector comprises various production technologies. Traditional technologies refer to fibres and threads, weaving, knitting and finishing. In sheer numbers, these technologies dominate the Canadian textile industry. They are followed by nonwoven technologies and, finally, carpet production technologies. The following table shows number of enterprises by type of production, and the contribution of TUTs and other value-added textiles (OVAT) to the industry as a whole.

Table 2. Survey of Companies, by Production Type

REGIONS	FIBRES & THREADS	KNITS	FABRIC ⁹	NON- WOVENS	FINISHING	CARPETS	TOTAL
Québec	30	34	31	13	29	6	126
Number	24%	27%	25%	10%	23%	5%	
Per cent							
Ontario	14	12	22	14	21	4	79
Number	18%	15%	28%	18%	27%	5%	
Per cent							
West. Canada	5	4	5	3	6	2	21
Number	24%	19%	24%	14%	29%	10%	
Per cent							
Atl. Canada	4	3	6	1	3	1	15
Number	27%	20%	40%	7%	20%	7%	
Per cent							
Total TUT + OVAT	53	53	64	31	59	13	241
Number	22%	22%	27%	13%	24%	5%	
Per cent							
Total Textile CAN	101	117	86	36	91	36	428
Number	24%	27%	20%	8%	21%	8%	
Per cent							
Proportion	52%	45%	74%	86%	65%	36%	56%

9. This category also includes braided products.



The Canadian TUT market represents 23% of industry sales, equating to US\$1.8 billion. The market in Canada is estimated at 380,000 tons. As shown in the table, 241 companies are now active in the technical and value-added textiles sectors, including 28% (118) exclusively. Between now and 2010, growth in the technical textile industry is forecast at 4% per year.

In terms of technologies, four industry markets are distinguishable according to production technology, type of raw material, and application market. These markets are:

- Technical Usage Textiles (TUT), commonly called *industrial textiles*
- Apparel
- Carpets
- Home textiles

TUT cover textiles whose manufacturing combines innovative materials and manufacturing processes. Non-visible, they are often integrated into other materials to impart additional characteristics to a product such as conductivity, non-flammability, or water repellence.

TUTs do not apply only to niche products. According to a CTT Group study,¹⁰ a large proportion of TUTs are used in commodity or volume products, and production of TUTs is already well underway in countries with low labour costs.

The so-called traditional markets are moving toward new, increasingly functional and high-performance products destined for niche markets. An example is the use of antimicrobial nanotechnologies on textiles used for dressings in the medical field. The term other value-added textiles (OVAT) is used to designate these distinct markets within traditional textile markets.

1.2 Technical Usage Textiles Market (TUT)

The technical usage textiles (TUT) market consists of 12 application sectors serving numerous end usages.

Canadian businesses are found in all 12 industry sectors, but five dominate in terms of the sheer number of companies. These are INDUTECH, PROTECH, BUILDTECH, MOBILTECH and MEDTECH.

10. Source: Vermeersch and Mlynarek, *op. cit.*

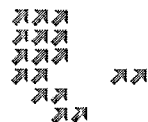














Table 3 shows the twelve TUT fields of application according to Messe Frankfurt.¹¹

Table 3. TUT Fields of Application

	MARKET SECTOR	BUSINESS FIELD	APPLICATION
	AGROTECH	Agriculture, horticulture, silviculture, fishing	Coverings, protection, picking, fishing, ties
	BUILDTECH	Construction and building	Protection, screens, construction materials, building components, reinforcement
	CLOTHTECH	Clothing and shoes	Shoe components, insulation, structure, sewing products
	GEOTECH	Geotextiles, civil engineering	Stabilization, separation, drainage, soil reinforcement, erosion control, linings
	HOMETECH	Furnishings, habitat and floor coverings	Carpet components, furniture components, cleaning, filtration, coverings and tarpaulins
	INDUTECH	Filtration, electronics and other industrial materials	Filtration, textile-reinforced rubber products, cleaning, lifting, pulling, electronic components, composites, other
	MEDTECH	Hygiene and medical	Cleaning, hospital linen, care devices, protection, biotextiles
	MOBILTECH	Automotive, rail, maritime and aeronautic	Textile-reinforced rubber products, safety, balance, insulation, floor coverings, protection, composites, other
	PACKTECH	Packaging	Block packaging, disposable packaging, ties, other
	PROTECH	Individual protection equipment	White room equipment, chemical protection, ant flame equipment, anticut equipment, outdoor use (IR, UV, etc. protection), other
	SPORTTECH	Sport and leisure equipment	Baggage components, sporting equipment, camping equipment, other
	OEKOTECH	Environmental protection	<i>Transverse field; products extracted from preceding sectors</i>

11. Messe Frankfurt is a major German organizer of textile fairs.

According to DRA,¹² application sectors that will demonstrate significant growth worldwide are: INDUTECH, GEOTECH, PROTECH, MEDTECH and SPORTTECH. In Canada, studies single out the PROTECH, MOBILTECH and INDUTECH sectors as likely to display the highest growth rates over the coming years.

1.3 Market for Other Value-Added Textiles (OVAT)

The Other Value-Added Textiles concept refers to so-called traditional textile products to which advanced technological characteristics have been added. They are mainly destined for conventional markets for the purposes of meeting new needs of end users.

Table 4. Other Value-Added Textiles (OVAT) Sectors

SECTOR	DESCRIPTION
ADVANCED SPORT AND LEISURE APPAREL (ASEL)	Textiles used in clothing integrating performance and functionalities specific to sport and leisure applications. Products in this category include all clothing and accessories designed for amateur, professional and non-conventional sport. The category is characterized by use of elastomers and other superior textile materials (e.g. spandex, aramids, etc.). Here, importance lies in application-related aspects, such as performance, comfort, functionality, breathability, impermeability, body temperature, air friction, etc.
ANTIMICROBIAL TEXTILES	Antimicrobial textiles include anti-odour, anti-fungal, anti-bacterial and anti-mite textiles. Eventually, this sector will include products whose fibres possess intrinsic bactericidal properties, or will have acquired them through subsequent treatments (chemical finishing, nanotechnologies, addition of bactericidal metals, etc.). These products have potential applications in apparel, intimate apparel, but also in a number of non-apparel applications (furniture, carpets, etc.).

Continued →

12. David Rigby Associates.

Table 4. Other Value-Added Textiles (OVAT) Sectors
(continued)

SECTOR	DESCRIPTION
EASY-CARE TEXTILES	These textiles significantly reduce or even eliminate traditional textile care operations (washing, spin-drying, drying, ironing). These textiles have potential applications in apparel, but also in other types of products (furniture, carpets, etc.). Qualities include: spill-resistant, wrinkle-resistant, oil-resistant, stain-resistant).
INTELLIGENTS TEXTILES	Classified in this category are all products using chemical, physical or electronic technologies to respond passively or actively to thermal, chemical, biological, electromagnetic and mechanical stress. These products include warming and cooling textiles, conductive textiles, communicating textiles, textile sensors and actuators, digital fashion, chromatic textiles, etc. These products have applications in the medical field, sport and leisure, the military and first responders market, intelligent applications in buildings, furniture, etc.
SPECIAL PROTECTIVE TEXTILES	These textiles offer special performance restricting them to specific applications listed in DRA's PROTECH classification. Presently, these are products with one of the following properties: insect-repellent, antistatic, anti-UV, water-repellent, waterproof, etc.
ULTRA COMFORTABLE TEXTILES	These textiles offer enhanced comfort when used in clothing. Characteristics can be modulated according to the application. The following qualities are associated: Elastic, super-absorbent, super-breathable, waterproof-breathable, cooling, etc.



1.4 Present and Future Users of Technical Textiles

Present and future users of Canadian textiles were surveyed in detail as part of a preliminary CTT Group Roadmap study.¹³ Nearly 41 North American buyers took part in the exercise. The study was based on Canada's largest TUT sectors in terms of number of businesses (INDUTECH, MEDTECH, MOBILTECH, PROTECH and OTHER VALUE-ADDED TEXTILES) and provided the following:

- Identification of principal clients
- Users' present sources of supply
- Recommendations for Canadian textile companies to enable demand to be better satisfied

Table 5 on the following page shows the principal present and future users (clients) of the Canadian textile industry, according to application.

1.5 Technical Textile Market Trends

On a global scale, the largest application sectors in the world (in terms of volume) are currently PACKTECH, MOBILTECH, HOMETECH and INDUTECH, representing 56% of the total TUT market.

It should be stressed that volume does not necessarily correspond to the sector's monetary value, not profit potential. In fact, MOBILTECH applications alone represent 25% of world sales.¹⁴

Figure 7 on page 34 shows distribution, in percentage, of each application sector.

Worldwide TUT consumption has grown consistently since 1995. Table 6 on page 34 shows estimated growth rates worldwide for the various types of technical textiles.

13. Study of present and future TUT and OVAT users, CTT Group, March 2007.

14. See the CTT Group study "Canadian Technical Textile Manufacturing Profile", March 2006.



Table 5. Principal Users

SECTOR	COMPANIES	
INDUTECH	Concord Screen Belting Industries Siegling Canada Forona Textile	BDH Tech Niedner (Tyco) Prysmian Canada
MEDTECH	Alpha Pro Tech Precept Medical Products MIP Torbot Group National Towelette Bummis	Encompass Group LCC Lac-Mac Mellen Air Manufacturing Rockline Industries Babykins Products
MOBILTECH	Toyota Motor Lear Corp. Decrane Aircraft Seating Doral International Forest River	Intier Automotive Seating Multina Eurocopter Canada Bateaux Princecraft GMA Covet
PROTECH	Novacks Uniform VF Imagewear Peerless Garments Ten 4 Body Armor	Med-Eng Systems North Safety Products Ranpro Tulmar Safety Systems
ATVA	Groupe Forzani Fox River Mills Tilley Endurables	Coalision Sears Canada



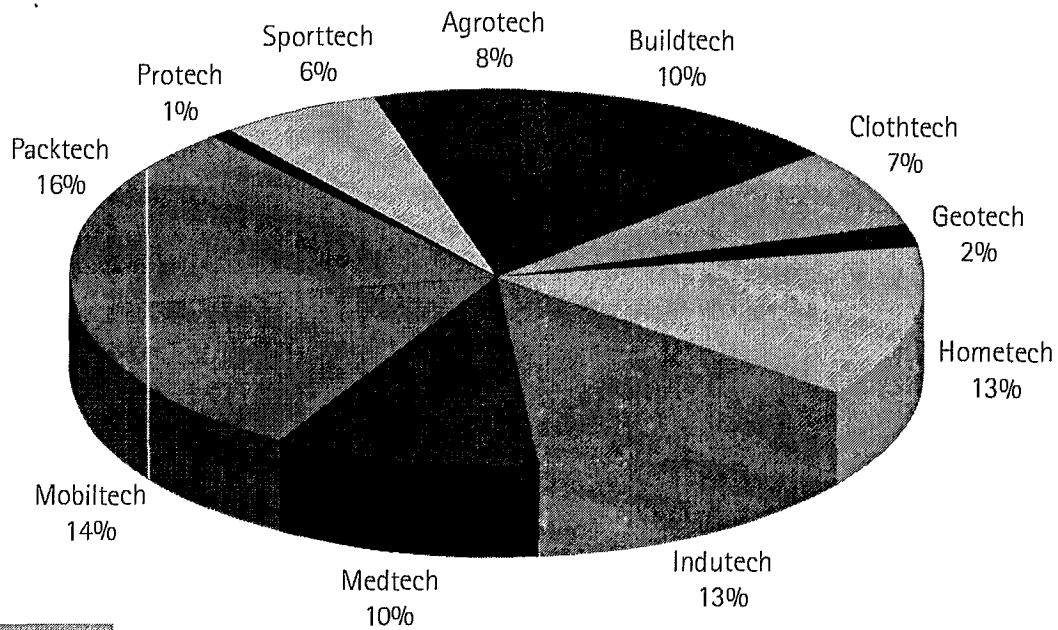


FIGURE 7
Distribution of
Application Sectors

Table 6. Estimated Growth Rates

TYPE OF PRODUCT	VALUE (US\$ MILLIONS)		ANNUAL GROWTH RATE 2005-2010
	2005	2010	
Nonwovens	19,394	24,958	5.2%
Unspun fibre	8,771	10,664	4.0%
Other fabrics	2,046	2,493	4.0%
Knitted fabrics	4,143	4,927	3.5%
Spun products	7,976	9,427	3.4%
Woven fabrics	64,570	74,820	3.0%
Coated and laminated prod.	51,010	58,946	2.9%
TOTAL	106,899	127,287	3.6%

Source (adapted): 150 End-Use Products in Technical Textiles and Nonwovens, World Market Forecasts to 2010, David Rigby Associates, 2002.

Needs in textile consumption are increasingly complex and demanding. Every point in the industry's value chain is involved in meeting clients' application demands.

Technological innovations already or almost achieved can be summarized as follows:

Intelligent Technologies

- Present market of US\$250 million (2004); US\$640 million in 2008
- Sophisticated products that integrate:
 - ➔ *Microelectronic or chemical elements in the form of captors, actuators, light sources, etc.*
- Multiple applications such as:
 - ➔ *Elements integrated into knitted fabric*
 - ➔ *Fabric or nonwovens for applications in the medical, protection, safety and sport fields, etc.*
 - ➔ *Textiles incorporating one or more functionalities*

Nanotechnologies

- Present market of US\$13.6 billion (2007); US\$115 billion by 2012
- Applications:
 - ➔ *Surface treatment*
 - ➔ Carbon nanoparticles
 - ➔ Clay nanoparticles
 - ➔ Metal oxide nanoparticles
 - ➔ *Finishing treatment*
 - ➔ Nano-sized emulsions
 - ➔ Nanocoating of self-cleaning polymer films
 - ➔ Nanoparticles (that cover while remaining transparent)



- Nanofibres:

- ➔ *Electrospinning*
- ➔ *Carbon nanotubes*
- ➔ *Spinning of ultra-resistant, electrically conductive fibres*

Nonwoven, Composite and Hybrid Technologies

- Integration of several components, or a combination of processes, e.g. nonwovens combined with warp-knitted fabrics
- Stitch-bonded-hydroentangled composites
- Spunlace, combined with spunbonded, carded, meltblown or airlaid, for the following application sectors: medical, hygiene, wiping rags, industrial products, clothing, protective sectors

High-Performance Fibres and Fabrics - Biotechnologies

- Various opportunities have been created by innovations in:
 - ➔ *Textile machinery*
 - ➔ *Fibre suppliers*
 - ➔ *Environmentally friendly products:*
 - ➔ Recyclable, biodegradable, energy-efficient, etc.
 - ➔ *Biotechnologies:*
 - ➔ Presently includes enzymes for desizing, bleach denim, etc.

Plasma Treatment

- Plasma is the ionized state of a gas. The gas reacts rapidly with fibre surfaces.
- Known applications:
 - ➔ *Waterproofing*
 - ➔ *Permanent oil-proofing of a fabric*



1.5.1 Competitive Constraints

According to a CTT Group study, "World competition in the technical textile sectors is very real. The methods that Europe¹⁵ has acquired and the lead that it has taken have enabled it to maintain an advantageous position in the market. The presence of major textile technology developers is, in this respect, an undeniable asset."

Equipped with valuable structures, European manufacturers are able to rely on various networks, including:

- AUTEX: a network of universities and engineering schools offering university-level textile programs
- EURATEX: a network of textile research centres
- PLATFORM, HUBS and CLUSTERS
- Research funding

Figure 8 shows various countries' levels of technological development, in descending order.¹⁶

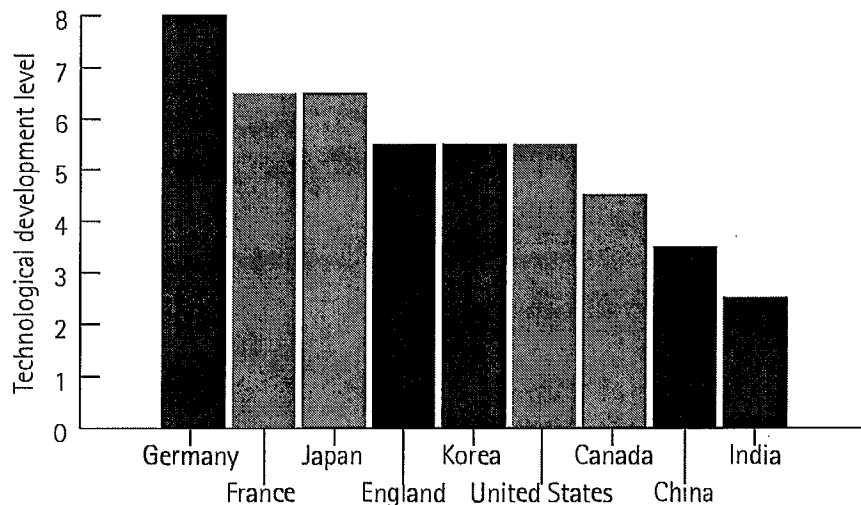


FIGURE 8
Level of Technological
Development, by
Country

Germany, France and Japan are the greatest developers of technical textiles.

Though China's contribution falls relatively low in the ranks, it represents a country of considerable size, not only in terms of its production of traditional and technical textiles, but also in terms of its ever-increasing levels of consumption. China is making increasingly vigorous efforts to boost R&D activities to meet demand.

15. Specifically, Germany, France and England.

16. The table was created following an analysis of all data available to the consortium.



Table 7 shows the positioning of the major producers in TUT markets.

Table 7. Positioning of Major Producers, by Country

COUNTRY	CHARACTERISTICS
GERMANY	<ul style="list-style-type: none"> ➔ Leading TUT and OVAT producer and consumer in Europe ➔ Significant synergy with manufacturers of textile machinery (cooperation) ➔ Dominant sectors: Medtech, Buildtech, Mobiltech, Smarttech and Protech
FRANCE	<ul style="list-style-type: none"> ➔ 380 companies active in TUT ➔ Dominant sectors: Indutech, Mobiltech, A&E, Medtech and Buildtech ➔ Well-financed and well-organized industry
JAPAN	<ul style="list-style-type: none"> ➔ TUT and OVAT: Innovation and power ➔ Controls offshoring (e.g. the date and terms for offshoring an innovative product's production are set at its launch.) ➔ R&D centres and strategic production sites
UNITED KINGDOM	<ul style="list-style-type: none"> ➔ 1/3 of textile manufacturers = TUT ➔ Numerous SMEs (of less than 40 people), distributed throughout the regions
KOREA	<ul style="list-style-type: none"> ➔ Severely affected by Chinese competition ➔ Apart from apparel: nonwovens, geotextiles and tires ➔ TRM: presence of research centres ➔ Developing three brands of clothing known worldwide between now and 2015 ➔ Increasing the share of textiles produced for technical markets (from 25% in 2005, to 55% in 2015)

Continued ➔

Table 7. Positioning of Major Producers, by Country
(continued)

COUNTRY	CHARACTERISTICS
UNITED STATES	<ul style="list-style-type: none"> ➔ Primarily geared to traditional textiles ➔ TUT and OVAT concentrated in the Carolinas ➔ Over 60% of nonwoven production based in the southeast ➔ Comprehensive protectionist measures since 2001 ➔ Leader: automotive and industrial sectors
CHINA	<ul style="list-style-type: none"> ➔ Leading textile producer in the world ➔ Modernization, rationalisation and adaptation of the industry: optimal insertion in the international industry chain ➔ Increasingly considering R&D ➔ Primarily targeting large volumes (clothing and home textiles) ➔ Targeted technical textiles: geotextiles, packaging and clothing components
INDIA	<ul style="list-style-type: none"> ➔ Pivotal role in the economy (14% of GDP –\$13 billion in exports) ➔ Presence of a TRM ➔ Growing exports ➔ Growing internal consumption ➔ New government measures to support targeted growth sectors (TUFS or Technology Upgradation Fund Scheme)
BELGIUM	<ul style="list-style-type: none"> ➔ Major production zone (knowledge) ➔ Coating, ennobling and nonwoven markets ➔ 1,000 companies, led by Beaulieu, Balta, Libeltex, Sieon and Centex
SPAIN	<ul style="list-style-type: none"> ➔ Over 280 companies (subsidiaries of major international groups)



1.6 Key Success Factors

Various CTT Group studies, especially those related to present and future TUT and other value-added textiles (OVAT) users, identify various key success factors:

- Developing and supporting innovation
- Forming partnerships with members of the value chain
- Providing companies with skilled personnel
- Offering unique, effective products
- Accessing capital
- Promoting what companies have to offer and their respective vision

Tables 8 and 9 show key success factors, by sub-sector.

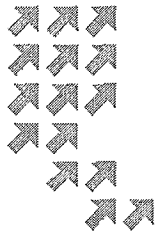
Table 8. Key Success Factors for the Textile Industry, by Sub-Sector

Legend				
INDUTECH	★ Filtration	△ Cars	MOBILETECH	
	☆ Rubberized products	● Public transportation		
	☆ Papermaking machine felt	● Special vehicles		PROTECH
	■ Electrical components	○ First responders		
	■ Wipes	◆ Workwear		OVAT
	□ Ropes	◆ Waterproof, high-visibility		
MEDTECH	● Hospital linen	◇ Military	AS&L	
	● Medical mattresses	■ Antimicrobial textiles		
	⬡ Medical care	□ Easy-care textiles		
	▲ Towelettes			
	▲ Feminine hygiene and diapers			

Continued →



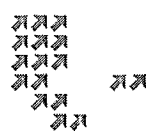
Table 9. Key Success Factors for the Textile Industry, by Sub-Sector



KEY SUCCESS FACTORS										
Effective promotion	■	■		■	■	■	■	■	■	■
Innovation capacity (R&D)	■		■		■	■	■	■	■	■
Appropriate strategy/commodity	■	■		■	■		■	■		■
Effective, reliable products	■	■		■	■				■	
Understanding of the value chain			■					■	■	■
Consumer intelligence and appropriation					■	■		■		■
Competent technical service		■		■						■
Technological intelligence and appropriation			■		■	■				■
Optimization of production costs		■		■			■			
Conscience & environmental strategy	■					■				■
High-performance products/values								■	■	■
Strategy to respond to market cycles		■		■	■					
financial investment capacity								■	■	
Legislative intellig. & appropriation						■	■			
World service and sales capacity	■				■					
Formation of partnerships									■	■
Meeting certification requirements		■		■						
Production flexibility										■
Product differentiation					■					
Offering stocks of a variety of products			■							

Legend

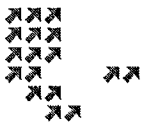
	Agrotech
	Buildtech
	Clothtech
	Geotech
	Hometech
	Oekotech
	Packtech
	Sporttech
	Intelligent text.
	Ultracomfortables



1.7 Strengths, Weaknesses, Threats and Opportunities

The box below lists some of the Canadian textile industry's strengths, weaknesses; threats and opportunities:

<p style="text-align: center;">STRENGTHS</p> <ul style="list-style-type: none"> ➔ Production flexibility ➔ Rapidity (response, delivery and service) ➔ Customized service ➔ Innovation capacity ➔ Overall production quality ➔ Export experience ➔ Competence of the workforce 	<p style="text-align: center;">WEAKNESSES</p> <ul style="list-style-type: none"> ➔ Financial resources ➔ Equipment and procedures ➔ Sales and marketing ➔ Product development ➔ Access to specialized raw material ➔ Regulation and trade policies ➔ Sector image
<p style="text-align: center;">OPPORTUNITIES</p> <ul style="list-style-type: none"> ➔ New markets (development and access) ➔ Product development ➔ New Technologies ➔ New market factors (drivers) ➔ Collaborative work 	<p style="text-align: center;">THREATS</p> <ul style="list-style-type: none"> ➔ Dwindling local markets ➔ Competition from imports ➔ Cost of imports from countries with low labour costs ➔ Production cost vs. lot size ➔ Retention of the workforce ➔ Canadian dollar

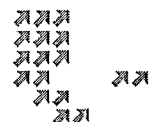


1.8 Challenges

The challenges faced by the Canadian textile industry concern nothing less than the sector's long-term survival, defined by its jobs, the number of companies and the expertise it has acquired (technical, export, product development).

Challenges for the industry are:

- Competition from developing countries
- Offshoring of its traditional clientele
- Availability, retention and training of the workforce
- The strength of the Canadian dollar
- Trade regulation
- Capital availability
- Access to specialized markets



2. THE CANADIAN TEXTILE INDUSTRY'S VISION

2.1 Manufacturers' Vision

The Canadian textile industry seeks to emphasize partnership and industrial networking to secure its future.

In the short term

The industry will stake its growth dynamic on optimizing available and existing technologies that are not presently being used to their full potential, and develop partnership between innovation and business.

In the medium term

The industry will match new technologies with those already mastered, adopt new technologies and be in a position to assume the financial and human resources requirements of any progress made.

In the long term

Canada will have a clear positioning/branding globally. The industry will be concentrated in small market niches, where it will be the dominant and recognized leader. The industry will have adopted a philosophy of sustainable business management.

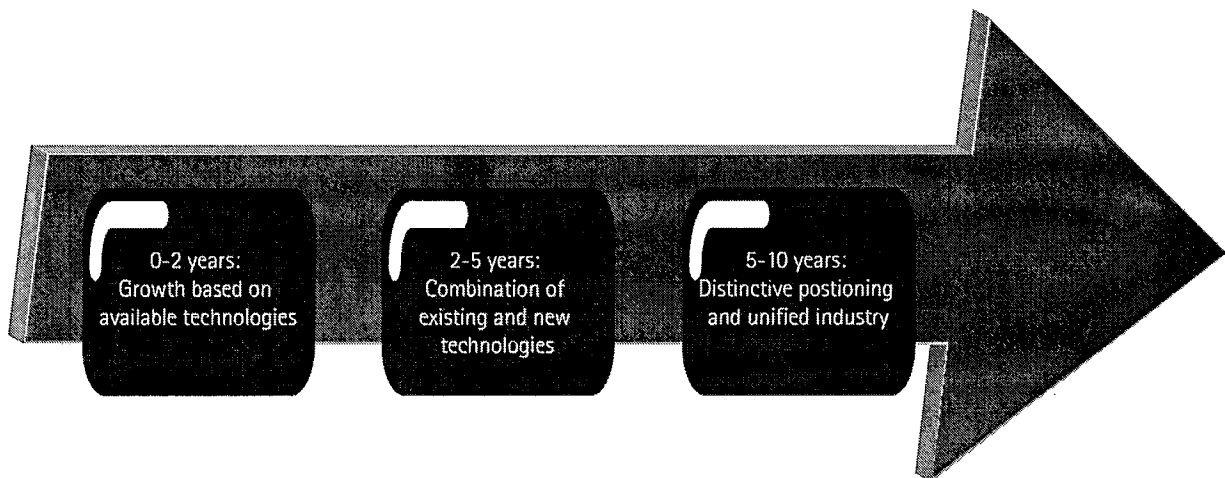


FIGURE 9
Industry's Vision

2.2 Demand Factors

Over 120 partners in the sector shared their vision of the Canadian industry over the next two to ten years. After sharing thoughts in a workshop context, participants identified 11 triggering factors requiring a "textile response" over the coming years.

The table below lists demand factors likely to influence the Canadian textile industry's offer, and where they figure in time.

Table 10. Demand Factors

DEMAND FACTORS	PERIOD FORECAST		
	0-2 YEARS	2-5 YEARS	5-10 YEARS
Population growth	■	■	■
Aging of the population	■	■	■
Environmental concerns	■	■	■
Geopolitics and world conflicts	■	■	■
Regulations and trade agreements	■	■	
Purchases by government channels	■	■	■
Availability of natural resources		■	■
Purchasing power		■	■
Industrialization and deindustrialization	■	■	■
Facility of transportation		■	■
Quality of life	■	■	■



When the eleven driving factors were ranked in terms of priority, six were identified as having a particular influence on the textile industry over the next ten years.

2.2.1 High-Priority Demand Factors

The eleven demand factors were ranked in order of priority by workshop and subcommittee participants with the intention of steering the industry towards high-priority development axes.

The following six demand factors were ranked as top priorities by participants.

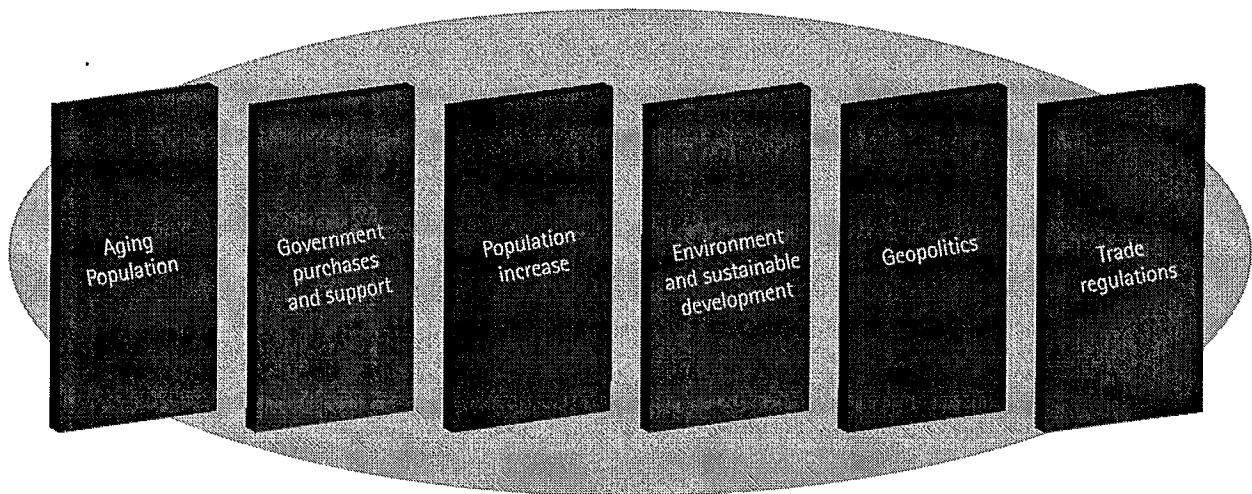
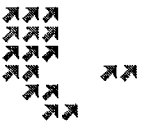


FIGURE 10
The Six Key Market
Demand Factors

The first market factor likely to set the tone for the Canadian textile industry over the coming years is the aging population of western countries. This market reality poses major challenges in terms of healthcare needs, purchasing power and quality of life.

- ➔ *According to the firm Senior Strategic,¹⁷ the number of people aged 60 and over reached 629 million worldwide in 2004. By 2050, it is forecast to hit 2 billion, when, for the first time in history, the aged will outnumber children*

- 17. Senior Strategic is an economic and sociological research organization and consulting agency in strategy and marketing specializing in the seniors and baby boomers markets.



(0-14 year-olds). Asia, at 54%, will host the largest share of the elderly population; Europe will come second with 24%.

The second factor mentioned concerns partnership with government agencies as purchasers and sources of incentives for the industry. The implementation of local purchasing policies by governments and para-public corporations provides a significant boost to a wide range of business initiatives. For many businesses, government incentives help to develop new products, invest in new technologies and even, in some cases, secure their long-term survival.

- ➔ *The value of government purchases in Québec (goods and services in all categories) was \$29 billion in 2006, and \$150 billion for all of Canada.¹⁸*
- ➔ *As a major corporation, Hydro-Québec purchases \$5.2 million worth of textile products annually (in the form of clothing). The Corporation d'approvisionnement Laurentides-Lanaudière, which serves a number of healthcare establishments (hospitals, nursing homes, long-term care facilities, etc.), has an annual linen/bedding budget of \$1 million, from a total purchasing budget of \$80 million.*

The third most important factor is world population growth, which is creating a range of opportunities in a number of application sectors.

- ➔ *According to the United Nations, the global population will hit 9.1 billion in 2050, a 40% increase over the 2005 population. Growth will be mainly concentrated in developing countries, which will represent 85% of the total population in 2050.*

The following crucial factor relates to changes in the environmental and sustainable development fields:

- ➔ *Aware that our society has become increasingly concerned by human impact on the environment, the Canadian textile industry is seeking to respond to new environmental concerns, not only in terms of best practices in production processes, but new product development as well.*

18. Source: MDEIE – Direction du développement des industries. Figures do not include operating expenses.



Undeniably, geopolitical dimensions represent a market factor which offers opportunities to develop new products and technologies.

- ➔ *In 2005, armed forces personnel around the world involved 28 million soldiers. In 2007, defence expenditures by NRC countries (NATO-Russia Council) were estimated at 23,405,852 million US dollars. Over the same period, Canada had 62,000 soldiers and a budget of \$13 billion.*

Last and by no means least, trade regulations present their own fair share of industry opportunities and constraints. A number of recent trade agreements (such as NAFTA, FTAA, CBTPA, USTDA, LDC, and Mexico-US agreements) have considerably changed the face of international trade.

2.2.2 Other Demand Factors

Other factors identified by workshop participants as having an influence on the industry's future are:

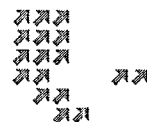
- The availability of natural resources, referring to tar sands development in the western provinces.
- The industrialization and deindustrialization that globalization has left in its wake, i.e. the industrialization of emerging countries, and the reduction of the number of industries in developed countries due to competition from countries with low production costs.
- Access to transportation: globalization and population growth present opportunities in the transportation sector that reflect increased movement, higher international trade volume, and so forth.
- Quality of life is increasingly important to the population as a whole and this development is having a range of effects on services and/or products.

2.2.3 Identifying Barriers to Market Demand

Factors driving market demand were analyzed to identify the principal barriers. Barriers of particular concern to participants were:



- Trade policies
 - ➔ *The vagaries of trade regulation make access to certain markets considerably more difficult.*
- Human resources
 - ➔ *The scarcity of labour, particularly in Québec, is a major obstacle for manufacturers.*
 - ➔ *Retention, training and availability are crucial issues for the industry.*
- High labour costs
 - ➔ *Canadian businesses wage dynamic represents a considerable issue when competing with counterparts based in low labour cost developing countries.*
- The Canadian dollar
 - ➔ *Since over 80% of Canadian exports are destined for the United States, the cost-based advantage has been reduced or practically inexistent over the last three months. Moreover, the protectionist policies of some countries have limited the exportation of a number of products.*
- The size of the Canadian market
 - ➔ *The Canadian market remains a small, but desirable, market.*
- Green trends
 - ➔ *Growing environmental awareness, new standards and sustainable development policies represent sturdy business opportunities while creating a variety of constraints in a market in transition.*
- Energy (natural resources)
 - ➔ *Although Canadian industry occupies a privileged position in terms of energy for production activities, textile industry energy costs are nevertheless an issue, and the world increase in energy demand has done nothing to relieve pressure on prices. In terms of both production needs and access to raw materials (namely, petroleum derivatives), this issue clearly has an influence on the industry.*



■ Foreign competition

- ➔ *The growing availability of foreign importations is a serious issue.*

■ Supply of raw materials

- ➔ *Until quite recently, the textile industry in Canada purchased its raw materials locally. A series of business closings has had a major effect on raw material supply. Today, the textile industry must increasingly purchase abroad, changing dynamics within businesses.*

2.2.4 Growth Markets

Workshop participants confirmed that demand factors primarily related to the PROTECH, MEDTECH, MOBILTECH and BUILDTECH sectors. Other applications cited by manufacturers included the high-performance clothing and accessories market, followed by industrial applications.

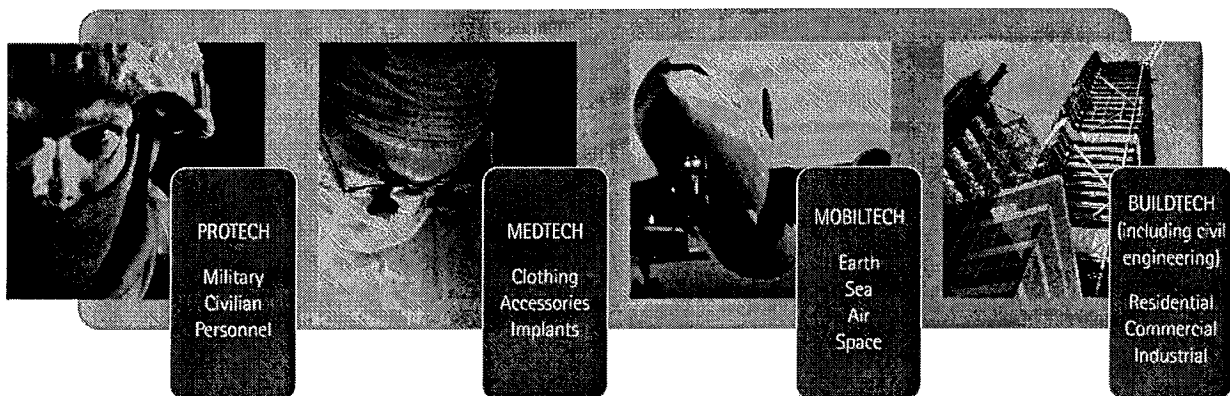


FIGURE 11
Growth Markets



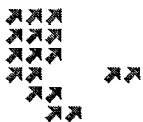
Table 11. Examples of Textile Technologies in Canada, 2008–2018

SECTORS	HIGH-PERFORMANCE MATERIALS IN USE	SPECIALIZED PRODUCTION TECHNOLOGIES	GREEN PRODUCTS AND TECHNOLOGIES
PROTECH	<ul style="list-style-type: none"> ➔ Lightweight, fire-resistant protective textiles with variable functionalities ➔ Protective filters against gases, allergens, viruses, etc. ➔ Pierce-resistant textiles ➔ Impact-resistant textiles for armour 	<ul style="list-style-type: none"> ➔ Design of multilayer functional structures ➔ Hybrid and composite structures ➔ Nano-technology components ➔ Manufacturing of resilient ballistic structures 	<ul style="list-style-type: none"> ➔ Non-carcinogenic coatings ➔ New fibre technologies (for example – natural fibres and biofibres) ➔ Recycling systems
MEDTECH	<ul style="list-style-type: none"> ➔ Functional textiles for healthcare uses ➔ Textiles with integrated captors ➔ Composites for orthopedics ➔ Implants 	<ul style="list-style-type: none"> ➔ Encapsulation of active principles in textiles or fibres ➔ Electronic circuits ➔ Composites moldable at low temperatures ➔ Implants with absorbable fibres 	<ul style="list-style-type: none"> ➔ New fibre technologies (for example – natural fibres and biofibres) ➔ Active biological agents ➔ Product disposal methods

Continued ➔

Table 11. Examples of Textile Technologies in Canada, 2008–2018 (continued)

SECTORS	HIGH-PERFORMANCE MATERIALS IN USE	SPECIALIZED PRODUCTION TECHNOLOGIES	GREEN PRODUCTS AND TECHNOLOGIES
MOBILTECH	<ul style="list-style-type: none"> ➔ Lightweight acoustic textiles ➔ Textiles for structuring elements ➔ Aesthetic and functional textiles 	<ul style="list-style-type: none"> ➔ Structures with micro- and nanofibres ➔ Composites moldable at low temperatures ➔ Self-cleaning covering materials 	<ul style="list-style-type: none"> ➔ Recyclable materials ➔ Recyclable thermoplastic coatings ➔ Replacement of glass fibre ➔ Replacement of thermosetting composites
BUILDTech	<ul style="list-style-type: none"> ➔ Lightweight construction materials ➔ Advanced acoustic and thermal insulation textiles ➔ Natural VOC-free acoustic and thermal insulation textiles ➔ Geocomposites ➔ Insulation geotextiles 	<ul style="list-style-type: none"> ➔ Extra-high tenacity woven structures ➔ Structures with micro- and nanofibres ➔ Natural fibre structures ➔ Erosion-control geotextiles with captors 	<ul style="list-style-type: none"> ➔ VOC-free coatings ➔ Replacement of glass fibre ➔ Renewable natural fibres



2.3 The Industry's Vision and the Shortfalls to Overcome (Success Factors)

Shortfalls that must be overcome over the next 10 years in order to achieve the industry's vision have been identified as the following:

- Technology
- Access to financial resources
- Human resources and the implementation of workforce retention programs
- Information (including consumer awareness)
- Sales and marketing (especially branding)
- Research and development (innovation)
- Industry support from government agencies, research centres and associations



3. NEEDS AND PREREQUISITES

3.1 Targeted and Prerequisite Technological Opportunities

For each market demand factor, participants developed ideas for technological opportunities (projects) that might be realized over the next 10 years.

Project development involved identifying both tangible (or "hard") and non-tangible (or "soft") technological opportunities. The latter became the subject of an additional analysis, after which some were reclassified as prerequisites for project implementation.

Tables 12 through 17 list the technological opportunities targeted and their respective prerequisites, by demand factor. Participants also established a probable time frame for their project, identified according to the following colour system:

Legend

Within 2 years
Within 5 years
Within 10 years

- Table 12. Aging of the Population, p. 56
- Table 13. Government Purchases and Support, p. 57
- Table 14. Population Increase (including increased purchasing power), p. 59
- Table 15. Environment and Sustainable Development, p. 60
- Table 16. Geopolitics, p. 62
- Table 17. Regulation and Trade Agreements, p. 63

Table 12. Aging of the Population



VISION: AFFORDABLE, COMFORTABLE AND RELIABLE PRODUCTS THAT PROVIDE A HIGHER QUALITY OF LIFE	
TECHNOLOGICAL OPPORTUNITIES	
➔	New line of high-performance textiles destined for the active seniors market
➔	New absorbent fibre for the incontinence products market (i.e. natural, chemical and green)
➔	Liquid or gas product coating between two layers of fabric
➔	Lightweight, flexible and easy-to-use products
➔	New intelligent textiles (e.g.: detection, integrated sensors, etc.)
PREREQUISITES	
➔	Define seniors' satisfaction with textile products
➔	Conduct an analysis of user needs
➔	Stimulate vertical and horizontal collaboration in the value chain
➔	Reinforce the partnership between manufacturers and R&D establishments

Legend

Within 2 years

Within 5 years

Within 10 years



Table 13. Government Purchases and Support

<p>VISION: MAKE GOVERNMENT ACTORS PARTNERS IN THE DEVELOPMENT OF THE NEW TEXTILE INDUSTRY THROUGH THEIR IMPLICATION IN PURCHASES AND THEIR SUPPORT FOR PRODUCT AND MARKET DEVELOPMENT</p>
<p>TECHNOLOGICAL OPPORTUNITIES</p>
<ul style="list-style-type: none"> ➔ Revision and clarification of Canadian content policy with various government organizations and all major companies receiving government aid – Buy Canadian ➔ Access to development, support and financing for business initiatives connected with sustainable development ➔ Support for exports and trade initiatives
<ul style="list-style-type: none"> ➔ Development of specific standards ➔ Support and encouragement for Canadian environmental certification ➔ Achieve the highest possible per cent of Canadian purchases ➔ Set up clusters implicating the textile industry in high-priority sectors ➔ Support advanced textile industries and centres of excellence by encouraging training and skills transfer ➔ Product purchases certified by government purchasing groups ➔ Pursue initiatives to support the marketing of unique technologies



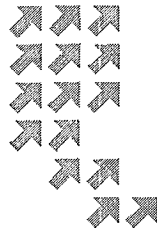
Legend

Within 2 years
Within 5 years
Within 10 years

Continued ➔



Table 13. Government Purchases and Support (continued)



VISION: MAKE GOVERNMENT ACTORS PARTNERS IN THE DEVELOPMENT OF THE NEW TEXTILE INDUSTRY THROUGH THEIR IMPLICATION IN PURCHASES AND THEIR SUPPORT FOR PRODUCT AND MARKET DEVELOPMENT

PREREQUISITES

- ➔ Create an industry committee dedicated to analyzing the purchasing policies of the state and major corporations to establish, among other things, Canadian content as a per cent of government and municipal purchases, and to determine the highest per cent possible, according to international agreements
- ➔ Stimulate vertical collaboration in the value chain
- ➔ Build awareness in the various levels of government of the Canadian industry's possibilities, i.e. concerted lobbying



Table 14. Population Increase (including increased purchasing power)

<p>VISION: THE CANADIAN INDUSTRY BECOMES AN EXPORTER OF NEW SOLUTIONS IN TARGETED FIELDS. THIS EXPANSION IS TO BE SUPPORTED BY DEVELOPMENTS IN SPECIALIZED CLUSTERS</p>
<p>TECHNOLOGICAL OPPORTUNITIES</p>
<ul style="list-style-type: none"> ➔ Increased demand for textiles and textile products in emerging countries ➔ Increased demand for textiles and textile products in developed countries (production in emerging countries will be concentrated more on needs of local markets). ➔ Carry out technological development projects in targeted sectors (one project per year)
<p>PREREQUISITES</p>
<ul style="list-style-type: none"> ➔ Analyze user needs in specialty niches ➔ Stimulate vertical and horizontal collaboration in the value chain. ➔ Develop a cooperation strategy for export projects ➔ Associate with companies abroad in targeted fields of specialization



Legend

Within 2 years

Within 5 years

Within 10 years



Table 15. Environment and Sustainable Development



VISION: BINDING ENVIRONMENTAL RULES ARE APPLIED TO LOCAL PRODUCERS, AND FUTURE DEVELOPMENTS WILL BE UNDERTAKEN WITH FULL EVALUATION OF THE PRODUCT LIFE CYCLE	
TECHNOLOGICAL OPPORTUNITIES	
➔	Chemical products that are more effective and more compliant with environmental regulations
➔	Integrating environmentally friendly technology and promoting environmentally friendly product design
➔	Development of products and procedures using ecodesign methods with chain members
➔	Purification and reuse of wastewater in the textile production process
➔	Replacement of environmentally unfriendly materials with acceptable products
➔	Development of new fibre technologies (domestic natural fibres such as hemp or linen)
➔	Using recycled fibres supported by the appropriate sorting equipment
➔	Percentage of recyclable content in products in relevant sectors
➔	Study on the feasibility of a plant manufacturing polyester fibre from recycled PET
➔	Highly energy-efficient textile
➔	Canadian certification in "environmental responsibility" (including, for example, mandatory materials recovery, production of reusable products, etc.)
➔	Production of natural fibres

Legend

Within 2 years

Within 5 years

Within 10 years

Continued ➔

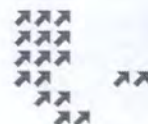


Table 15. Environment and Sustainable Development
(continued)

<p>VISION: BINDING ENVIRONMENTAL RULES ARE APPLIED TO LOCAL PRODUCERS, AND FUTURE DEVELOPMENTS WILL BE UNDERTAKEN WITH FULL EVALUATION OF THE PRODUCT LIFE CYCLE</p>
<p>PREREQUISITES</p>
<ul style="list-style-type: none"> ➔ Analyze existing processes and devise courses of action for green solutions ➔ Conduct an analysis of user needs (product development) ➔ Determine textiles' place in: infrastructure and civil engineering projects, environmentally friendly buildings, transportation solutions and more ➔ Gain a better understanding of the concept and assist businesses in applying it (corporate responsibility) ➔ Stimulate vertical and horizontal collaboration in the value chain ➔ Work to revise laws

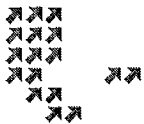
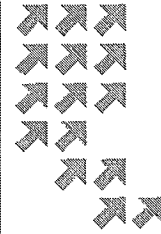


Table 16. Geopolitics



<p>VISION: THE TEXTILE INDUSTRIES WILL HAVE CREATED STRONG SUPPLY CHAINS AND NEW LOCAL EXPERTISE</p>	
<p>TECHNOLOGICAL OPPORTUNITIES</p>	
<p>➔ More effective and ultra-comfortable textiles for protective clothing</p>	<p>➔ Production of domestic natural fibres (hemp, linen)</p>
<p>➔ Launch development projects for intelligent products</p>	<p>➔ New niche products designed for protection</p>
<p>➔ Establish recycling channels for textile materials</p>	
<p>PREREQUISITES</p>	
<p>➔ Conduct an analysis of user needs</p>	
<p>➔ Analyze protection methods for civilian and military uses and determine which technological shortfalls need to be filled</p>	
<p>➔ Identify indispensable strategic materials and alternative sources in terms of of problems</p>	
<p>➔ Encourage vertical and horizontal collaboration in the value chain and determine what the strategic finished products are</p>	
<p>➔ Reinforce the partnership between manufacturers and R&D establishments</p>	

Legend

Within 2 years

Within 5 years

Within 10 years



Table 17. Regulation and Trade Agreements

VISION: REGULATION WILL BE EQUITABLE AND THE INDUSTRY WILL HAVE THE MEANS TO COMPETE ON EQUAL TERMS WITH IMPORTS
TECHNOLOGICAL OPPORTUNITIES
<ul style="list-style-type: none"> ➔ Representative organization to support and defend the interests of the new textile industry in Canada in a context of globalization ➔ Access to federal and provincial government financial aid programs dealing with diversification and R&D ➔ New local environmental regulations and a set of laws framing imports ➔ Application of the same established rules to imported products as to local products ➔ Negotiation of duty-free status on textile products made from fibres or classes of fibres made outside of NAFTA ➔ New technologies directed at identifying non-compliant imported products sold in Canada ➔ Rigorous application of the established rules
PREREQUISITES
<ul style="list-style-type: none"> ➔ Ensure clearly identified local policies on imports are in place ➔ Establish import rules on environmental compliance, toxicity, quality of textile products, and more ➔ Identify points that are disadvantageous to the industry in existing agreements ➔ Secure a coalition throughout the textile value chain ➔ Develop an image communication strategy for the new textile industry in Canada

Legend

Within 2 years

Within 5 years

Within 10 years

3.2 Products' Desired Critical Characteristics and Functionalities

Participants analyzed each of the market factors to determine the product characteristics and functionalities they considered to be very important.

To do this, over 20 characteristics and functionalities were identified in order to adequately respond to demand factors in the target market or to integrate growth sectors.

Table 18 below presents the main elements that emerged.

Table 18. Product Characteristics and/or Specialties Based on Market Factors and Growth Sectors

BASED ON MARKET FACTORS	BASED ON GROWTH FACTORS
Performance	Performance
Quality	Quality
Ease of maintenance	Lightness of weight
Disposability and preferably recyclability	Protection
Antimicrobial, antibacterial properties	Durability
Service	Comfort
Protection	Service
Local content	Functionality
Product value (quality/price ratio)	Local content
Design (aesthetic and functional)	Product value (quality/price ratio)

Other characteristics and specialities identified referred to products that were more: equitable, stretchable, movement-facilitating, intelligent (tracking), customized, likely to have a good quality/price ratio, absorbent, likely to have branding; or were accompanied by related services.

3.3 Existing Technological Capacities

As mentioned above, in the vast majority of companies, the industry's technological development is primarily based on traditional technologies. Several new technologies however already enjoy exclusive utilization. They are also complementing or being used in tandem with traditional technologies.

The Canadian textile industry is characterized by two types of technologies:

- Traditional Technologies
- New Technologies

3.3.1 Traditional Technologies

Traditional technologies¹⁹ are present in the majority of Canadian industries, specifically in spinning, weaving, knitting and nonwoven companies.

In spinning enterprises, we find:

- Techniques for interweaving warp yarns and the weft in three basic constructions: plain weave, twill or serge, and satin
- More complex weaving techniques: velvets and plush, Jacquard motifs, crepe, herringbone weave, basket weave, etc.

In terms of knits, the following technologies stand out:

- Techniques for interlacing thread loops based on two main principles: weft-knitting and warp-knitting

In nonwovens, the following technologies are present:

- Dry processes
- Wet processes
- Chemical extrusion processes

19. Data refers to technologies defined as traditional in *La filière industrielle des textiles au Québec* – Direction générale des communications et des services à la clientèle – 2003.



Technological advances and the expertise of Canadian manufacturers have enabled many of these technologies to be adapted to respond to criteria for small batches and rapid style changes. The implementation of new weft insertion methods has speeded performance rate considerably.

These traditional technologies have been supported by automation of production processes, enabling better productivity, flexibility and superior fabric quality.

The box below summarizes participants' views on the strengths and weaknesses of traditional technologies.

STRENGTHS	WEAKNESSES
<ul style="list-style-type: none"> ➔ Positive reputation of Canadian products 	<ul style="list-style-type: none"> ➔ Absence of Canadian equipment manufacturers
<ul style="list-style-type: none"> ➔ Flexibility, quality, consistency 	<ul style="list-style-type: none"> ➔ Traditional technology initially designed for high-volume commodity products
<ul style="list-style-type: none"> ➔ Capacity for equipment adaptation 	<ul style="list-style-type: none"> ➔ Aging equipment stock
<ul style="list-style-type: none"> ➔ Improvement of processes and procedures 	
<ul style="list-style-type: none"> ➔ Development capacity 	

3.3.2 New Technologies

Less common than traditional technologies, the use of emerging technologies is nonetheless on the rise in Canada. However, development of these new technologies remains tentative.

"Intelligent" Technology

Technologies now being used are directed mainly at improving certain functionalities.



STRENGTHS	WEAKNESSES
<ul style="list-style-type: none"> ➔ Used in development of such products as electrotexiles, phase-changing materials, functional membrane or coating, antibacterial, anti-contaminant ➔ Other applications to be developed (shape memory materials). 	<ul style="list-style-type: none"> ➔ Basic equipment developed in other countries ➔ Application techniques (finishing) difficult to adapt in certain cases

Nanotechnology

Development of nanotechnologies has begun in Canada. Application of nanoparticles to materials, known as nano-finishing, is found in this category.

STRENGTHS	WEAKNESSES
<ul style="list-style-type: none"> ➔ Contributes an "additional functionality to the product" dimension, such as antibacterial silver nanoparticles 	<ul style="list-style-type: none"> ➔ Little or no Canadian producers (except SilverClear™) ➔ High cost of materials vs. market interest



Composite Materials

Use of composite materials is characterized in Canada by lamination or coating of nonwovens and other types of fabric (assembly of various materials).

STRENGTHS	WEAKNESSES
<ul style="list-style-type: none"> ➔ A number of products are already on the market (e.g. Mobiltech, Protech, Buildtech, etc.) ➔ Encourages multi-sectoral networking 	<ul style="list-style-type: none"> ➔ Cost of development (equipment, prototypes, trials) ➔ Cost of acquiring production equipment ➔ High cost of intellectual protection (obtaining patents), and complexity

Printing Technologies

The most rapidly expanding printing technology is currently digital printing.

STRENGTHS	WEAKNESSES
<ul style="list-style-type: none"> ➔ Contributes aesthetic dimensions ➔ Serves the customized market 	<ul style="list-style-type: none"> ➔ High costs ➔ Now used for small, custom-designed runs (e.g. Cirque du Soleil costumes, flags) ➔ Production speed still limited ➔ Complexity of printing on certain fibre blends



3.4 Shortfalls and Obstacles

In the face of market factors, projected products and desired functionalities, the Canadian industry must come to terms with shortfalls and obstacles at different points in the textile industry's value chain.²⁰

In terms of inputs, shortfalls to overcome include:

- Wider access to equipment
- Easier purchasing in terms of fibre (i.e. synthetic and natural)
- Access to locally produced fibres

In terms of the textile industry (processing), shortfalls listed were as follows:

- Capacity for thread texturing is limited
- Production of nonwovens is also limited
- R&D is directed at new product development
- New technologies (e.g. electrospinning, surface treatment, nanotechnologies, etc.)
- Commercialization and branding
- Training and human resources policies

In terms of end users, shortfalls to overcome are:

- Understanding the actual needs of end users

20. See Figure 3: Textile Industry Networks, on p. 22.



4. TECHNOLOGY AND OTHER SUCCESS FACTORS

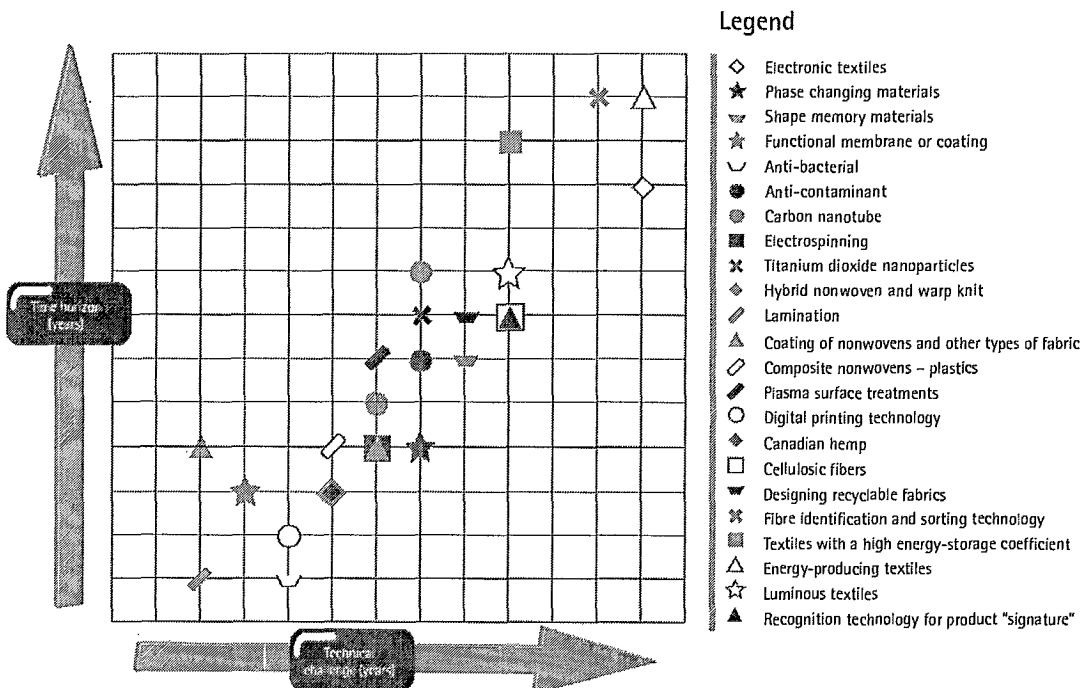
4.1 Evaluation and Ranking of Technologies

The technological progress achieved by the textile industry over past years has often been due to contributions from other industry sectors. For instance, the agricultural and petrochemicals sector is often associated with fibres, mechanical engineering and electronics with equipment, and chemistry with dyes and coatings. The technologies developed are then adapted and used in manufacturing textile products.

Likewise, with the exception of certain products like carpets, a textile can either be the base or key material in consumer products like clothing, furniture, automobiles and boat hulls. In these cases, it is the end user who carries out product development and promotion. Thus, the technologies developed are contributory to more than one industry.

Figure 12 below presents these various technologies and their positioning in terms of the technical challenge they pose and the probable time horizon for their realization.

FIGURE 12
Ranking of
Technologies



4.2 Recommended Technologies

According to current knowledge, the following technology initiatives must be implemented in order to support Canadian industry in its development of the functionalities and characteristics of future products:

- Integration of new functionalities in structuring materials
- Adaptation and modification of current processes and equipment for the new fibres and materials (efficiency and accuracy)
- Refinement of conductive, electronic and intelligent technologies
- Development of shape memory technologies
- Adaptation of advanced technologies such as polymer replacement of metals
- Adaptation of condition technologies (multifunctionality)

4.3 Decision Factors and Time Frame for Technological Development

The decision factors affecting adoption of new technologies in the textile industry are connected, first and foremost, to market demand and potential. This is beyond the foreseeable change in the demand and time-frames as presented above (see Section 3.1, Tables 12 through 17).

Several technologies (new and emerging) already offer more effective solutions in terms of meeting existing needs, particularly in the field of composite materials. These materials offer viable solutions for replacing dated product assembly methods (e.g. in the automotive field).

Other decision factors must also be considered to determine the rate at which new technologies will be adopted, including:

- **Financial capacity:** A number of companies in the sector are seeking to adopt new technologies, but have difficulty raising the technological project finance necessary to justify such acquisitions.



- **Human resources:** New technologies often require new skills. Once again, training and the availability of qualified human resources are significant challenges for the textile industry.
- **Integration support:** New technologies often require a testing and break-in period, which must be supervised by experts, developers and/or retailers of the technology. The availability and support of these resources in the startup and commercialization phases represent a critical success factor in the technology's adoption.

4.4 Other Success Factors

The strength of an industry lies in its capacity to adapt and improve the range of its activities in order to attain projected goals.

The activities discussed were:

- Human resources
- Production
- Commercialization
- Finance
- Research and development
- Government support

Participants then pinpointed a number of success factors that must figure in the Roadmap process in order to secure the future of the Canadian textile industry.

4.4.1 Human Resources

Context

- The sector is experiencing significant human resources problems. According to CSMO Textile, the industry's workforce is older than the average working population. Companies must prepare themselves for a wave of retirements, requiring new recruitment. However, recruitment is becoming increasingly difficult. The Canadian textile industry is hurting because of its negative image, which is consequently affecting recruitment.



- A drop-off in enrolment has halted textile training activities in Canadian establishments. New programs cannot currently be developed and training needs have not been clearly identified. The only two training programs remaining are not adapted to companies' needs. Businesses are seeking short and specialized training programs.
- Québec has its own fiscal constraints which affect immigration

Observations

- Image of the sector in Canada
- Workforce availability, recruitment and retention are difficult
- Skills training and improvement need to be adapted
- Union/Employer partnership must be optimized

Success factors

- Refurbish and promote the sector's image by offering hi-tech careers that will attract new workers
- Facilitate access to immigration in order to recruit engineers from abroad
- Use more "proactive" language to define textiles
- Find, train and keep qualified personnel
- Identify the skills the industry requires
- Develop workers' multi-tasking skills
- Hire R&D, sales, marketing and engineering specialists
- Identify company and employee needs
- Adapt training in the workplace (customized training)
- Encourage unions and management to work together toward common goals
- Provide training for specialized resources (sales, production management)
- Develop a pool of qualified candidates through networking



4.4.2 Production

Context

- From its beginning, the Canadian textile industry has developed a wealth of expertise in production. Adapting equipment, cost reduction, automating operations, setting standards, introducing rapid response and just-in-time programs for specialized products in short stream and pull systems: the industry is extremely experienced. The Canadian industry has long been a sector with one of the highest rates of investment in equipment.
- Textile manufacturers previously concentrated on serving the needs of clothing manufacturers have had to rethink their dynamics to reflect major changes occurring in this core market segment.
- While the industry has had a magnificent past, it has recently been slow to develop new technologies, particularly in terms of nonwovens.
- Mass production is a thing of the past, and textile manufacturers must now direct their attention to small-batch production and/or very specific niches.

Observations

- Positive industry past
- Highly specialized expertise in production and process improvement
- Mass market
- New market realities

Success factors

- Pursue productivity efforts
- Adapt, customize and modify:
 - ➔ *Existing equipment*
 - ➔ *Manufacturing procedures*



- Adapt batch size to consumers' needs
- Increase our competitive advantages:
 - *Flexibility, rapidity, service and quality*
- Modernize equipment
- Integrate technological and production models observed in other industries
- Take advantage of new textile technologies

4.4.3 Commercialization

Context

- In Canada, the textile industry enjoyed an enviable position until early in the current decade. The spinoff effects of NAFTA and the robustness of the local market have created a situation in which market demand in most of the sectors' factories often exceeds supply.
- Except for rare exceptions, the vast majority of companies in the sector have not seen the value of investing in their workforce or in structures, or even of developing commercialization programs. As a result, most textile SMEs have a sales representative (i.e. either someone assigned to the job full-time or this role is carried out by the current company president) and a customer service manager.
- Only a few of the larger companies have invested in commercialization teams and/or specialized marketing personnel to ensure on-going commercial stability, including throughout downturn periods.
- Since the slowing-down of the sector in 2003, the situation has mostly remained static in terms of staffing while worsening for some. While some companies in the field have seen the value in increased investment in marketing personnel and tools to offset the drop in sales, most have effectively reduced their sales forces. This phenomenon was observed up close during the "Regional Assessment" project conducted with some thirty knitting companies in the sector.



- The sector has embarked on many projects over the past few years, often with the support of government: developmental projects, commercial assistance projects and projects aimed at developing export markets. While these projects have often yielded highly satisfactory results for participants, many are severely lacking in terms of product development and corporate promotion. This situation must be corrected as soon as possible.

Observations

- Sales and marketing operations are undeniable success factor. Enabling structured commercialization of products, they are often the motor that drives a company to new heights.

Success factors

- Ensure the sales force transitions towards a proactive and dynamic sales approach
- Access technical and value-added markets.
- Build connections to end users.
- Increase exports to non-traditional markets.
- Hire qualified personnel for the job.
- Produce high-quality communication tools.
- Formulate an Internet strategy.
- Promote the "Canadian difference."
- Know how to use branding.
- Become green (Canadian certification).
- Set up technological and marketing intelligence.

4.4.4 Finance

Context

According to the Ministère du Développement économique, de l'Innovation et de l'Exportation du Québec study "La filière industrielle des textiles au Québec", access to risk capital and financing for textile technologies is more difficult in Québec than elsewhere in North America. Currently available assistance programs are restrictive.



- Many projects never come to fruition because of difficulties in obtaining financing. For the financial sector, and lending institutions in particular, the textile industry represents a high-risk economic sector. Institutions know little about the industry's development potential, apart from the sector's traditional dynamism.
- Research and development, which normally involves various high-cost phases prior to commercialization (product development, intellectual protection, etc.), requires considerable investment that cannot always be borne by the company alone. The innovation process can often require two to three years before showing signs of profitability.
- Access to Canadian certification, regulation and approval agencies is costly.
- The sector's image, moreover, is a significant disincentive to investors.

Observations

- Access to financing must be facilitated to ensure the long-term survival of companies with potential

Success factors

- Refurbish and promote the industry's image in the financial community
- Increase the industry's visibility with banks, universities and major end users
- Create developmental projects with major prime contractors (DND, Bombardier, Hydro-Québec, etc.)
- Set rules for lending groups to share financial risks
- Establish an up-to-date portrait of individual businesses and specify capacities of each
- Develop communal planning tools (business plan and market analysis)
- Develop a funding program for product launches, emphasizing use of companies' internal resources



- Clarify access to risk capital for entrepreneurs
- Use examples of industry success to attract financing
- Make textile industry leaders more effective on a management level
- Access government fiscal and financial incentives for R&D application projects
- Encourage financial aid to promising companies
- Know funding programs in detail

4.4.5 R&D

Context

- According to the document "Filière Industrielle des textiles au Québec", the Canadian textile industry in general is reluctant to conduct the kind of scientific research likely to lead to discoveries, products or even fundamentally new procedures. Research and innovation efforts have been directed more at improving manufacturing processes, automation, and integrating new raw materials. R&D's goals are based on a commitment to respond effectively and economically to functionalities dictated by the market.
- A number of companies do not possess a specific R&D department and even fewer have dedicated resources.
- The industry relies on an intelligence network that includes higher education institutions, para-governmental organizations, associations and the CTT network, including the Centre for Textile Technologies and SAGEOS - Geosynthetics Technology Centre, both part of CTT Group in Saint-Hyacinthe.
- According to Statistics Canada's Survey of Advanced Technologies (1998), the Canadian textile industry was one of five core industries that integrated functional technologies most quickly into their activities.



Observations

- R&D is directed at improving processes rather than new products
- Many companies do not have a specific R&D department or dedicated resources
- Presence of two research centres

Success factors

- Working with contractual R&D suppliers
- Contracting skilled internal resources
- Reducing dependence on traditional initiators of textile innovation (i.e. manufacturers of chemical compounds and fibres)
- Encouraging networking between suppliers and other value chain actors
- Accessing R&D funding and tax shelters
- Creating R&D-based partnerships with other companies

4.4.6 External Factors (Government Support Policy, International Trade Policy)

Context

INCENTIVE POLICY (PURCHASING)

- Public and parapublic purchasing represent valuable business opportunities for industry. Local purchasing programmes, by various levels of consumer, can often secure an industry sector's long-term survival. Neither Canada nor its provinces have official programs of this kind.

INTERNATIONAL TRADE POLICY

- The complexity of markets regulated by various trade agreements puts a constraint on the development of local industries. Restrictive policies, increasingly prevalent in international trade, must be revised. Regulations affecting imports are not always honoured. Furthermore, market access is not always equitable.



Observations

- Absence of a formal policy on local purchases
- Complexity of international trade agreements
- Export/import regulations are not harmonized

Success factors

- Develop a strategy to persuade buyers to adopt a local purchasing policy
- Develop a "Buy Canadian" policy (government, institutions and major Canadian companies)
- Align Canadian businesses' interests to encourage partnership and networking
- Secure strong industry representation
- Strengthen efforts and develop a strategy to develop export markets
- Ensure traceability of Canadian products (local content)
- Gain a better understanding of trade regulations
- Promote our "nordicity"



5. STRATEGIC OBSERVATIONS

OUR STRENGTHS

Innovation + Reaction + Rapidity + Agility + Quality

In the process of formulating the Canadian textile industry's Technology Roadmap, 14 important observations were made:

OBSERVATION 1

The industry predicates its short-term progress on forming strategic alliances and networking within the value chain.

OBSERVATION 2

The driving forces stimulating industry demand over the coming years are: demography, environmental concerns, geopolitics, international trade considerations and government support.

OBSERVATION 3

The industry must pay due attention to a number of challenges, such as R&D, funding, human resources, access to markets, marketing and mastering information technology.

OBSERVATION 4

Canadian textile companies must become more specialized and occupy specific niches and assume a more important role in the creative process.

OBSERVATION 5

The primary growth sectors envisaged are: Protection, Medical, Transportation, Construction.

OBSERVATION 6

The Canadian textile industry tends to concentrate its technological development on improving processes (optimizing and adapting existing technologies) rather than moving quickly to adopt emerging technologies.

OBSERVATION 7

The industry is presently in the process of evaluating emerging technologies such as nanotechnology and intelligent textiles.

OBSERVATION 8

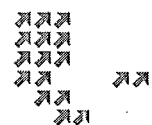
Composite and nonwoven technologies are experiencing strong growth.

OBSERVATION 9

Sustainable development is highly important for the textile industry, but the concept must be clarified, evaluated and adopted in present company structures and policies.

OBSERVATION 10

Via the Roadmap process, the industry has identified a number of technological projects (some can be addressed with existing technology, others via research and/or new technologies and new equipment).



OBSERVATION 11

The Canadian industry is conscious of the fact that it must enhance its image proactively through concrete actions

OBSERVATION 12

The Canadian textile industry wishes to acquire a distinctive brand.

OBSERVATION 13

The perception of government's role in industry is variable. However, a consensus exists on the importance of the government's role in defending the industry, especially with regards to international trade, government purchases and export assistance.

OBSERVATION 14

The industry affirms the importance of government's role in promoting projects that offer growth possibilities, consequently encouraging economic development.



6. RECOMMENDATIONS

The industry intends to "innovate through partnership." On the basis of the major planning work it has already performed, the industry has prepared a number of recommendations and an action plan that will set out the guidelines for achieving this new positioning.

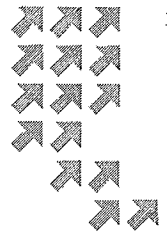
Considering the urgency and importance of acting, and to ensure prompt implementation of the plan, the Steering Committee recommends that top priority be given to implementing a permanent committee responsible for the implementation of the recommendations, the action plan, the communication plan and follow-up of the various projects.

The Steering Committee recommends:

Organization

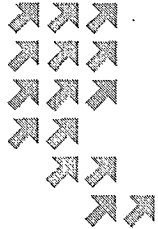
Recommendation 1: Permanence of the Technology Roadmap for the Canadian Textile Industry

SHORT TERM: 2008-2009	MEDIUM TERM: 2009-2012	LONG TERM: 2012-2018
Set up a representative and effective structure, meeting industry and lender expectations, that achieves the action plan, promotes it and serves as a sponsor.	Present a progress report and updated action plan to the industry.	Update the Technology Roadmap for the Canadian Textile Industry.



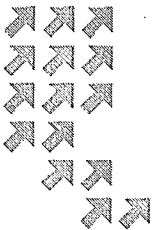
Innovation

Recommendation 2: Support the industry's shift from mass production to design and commercialization of specialized products



SHORT TERM: 2008-2009	MEDIUM TERM: 2009-2012	LONG TERM: 2012-2018
Develop a strategy to support growth-promising industrial initiatives aimed at developing R&D, innovation and commercialization networks in partnership with universities, users and sectoral associations.	Gain national recognition for the structure as a management interface for the textile innovation fund, and management of a first three-year investment program.	Commercialize technologies and products developed in these consortium projects in international markets.
Launch and establish structuring projects locally, involving a number of companies, in growth markets.	Develop a system of technology intelligence and information collection on new and emerging technologies.	Manage a second program (five-year, in this case) of textile innovation fund investments.

Recommendation 3: Profit from driving forces to develop leader products for tomorrow's markets



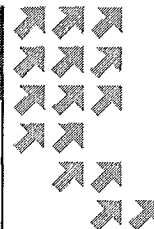
SHORT TERM: 2008-2009	MEDIUM TERM: 2009-2012	LONG TERM: 2012-2018
Study the evolution of needs in markets served.	Regularly contribute innovation products to markets to satisfy the demands of target populations.	Require prime contractors and government to provide purchasing contracts that include equitable specifications targeting sustainable development.
Establish a strategy that supports growth-promising industrial initiatives aimed at the emerging markets of geopolitical development and sustainable development.	Implement the strategy developed and promote it in terms of technology to contractors and users.	



Human Resources

Recommendation 4: Secure the presence of qualified human resources that meet new industry needs

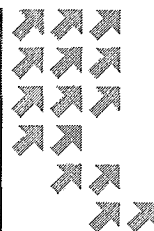
SHORT TERM: 2008-2009	MEDIUM TERM: 2009-2012	LONG TERM: 2012-2018
Redefine the human resources vision and textile education and continuing education models.	Ensure the training offer that responds to needs is available and used.	Revise training offer compliance in accordance with needs.



Partnerships

Recommendation 5: Know ourselves better to establish partnerships

SHORT TERM: 2008-2009	MEDIUM TERM: 2009-2012	LONG TERM: 2012-2018
Develop a detailed technological profile of the Canadian textile industry.	Update the directory and ensure it is distributed.	Update the directory and ensure it is distributed.
Create networking groups that encourage business partnerships between manufacturers.	Maintain networking groups.	Maintain networking groups.
Develop a virtual discussion forum to encourage information exchanges and provide centralized access to all industry-directed programs.	Secure self-financing for the virtual discussion forum and continually update information.	Secure self-financing for the virtual discussion forum and continually update information.
	Encourage formation of industry groups to facilitate purchasing and marketing synergies.	



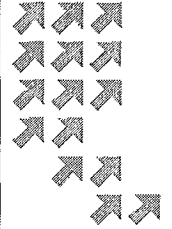
Recommendation 6: Position ourselves to join growth markets and internal and export markets

SHORT TERM: 2008-2009	MEDIUM TERM: 2009-2012	LONG TERM: 2012-2018
Create networking groups and events that encourage partnerships throughout the value chain (material and technology suppliers, processors and clothing manufacturers, buyers, prime contractors, legislators and specifiers) in growth markets.	Maintain networking groups and events around themes of common interest.	Gain recognition as high-quality players from at least two networking groups in industrial sectors serving growth markets.
Develop a strategy to address trade regulations that restrict domestic companies' import/export development, and set up facilitating mechanisms in their place.	Implement strategy and maintain ongoing dialogue with legislators (lobbying).	Ensure there is ongoing dialogue with legislators to support the long-term survival of the Canadian textile industry.
Develop a local purchasing policy to support textile sector development, taking into account the restrictions imposed by NAFTA.	Activate the local purchasing policy.	Consolidate the local purchasing policy.
Ensure that structuring initiatives for export market development are continued, such as Team Textile Canada, TCBC Shanghai and more.	Analyze the feasibility of developing business export offices for the Canadian textile industry in strategic markets (US, India, Brazil, etc.).	Secure the long-term survival of business export offices.

Communication and Image

Recommendation 7: Make ourselves known and recognize our true value

SHORT TERM: 2008-2009	MEDIUM TERM: 2009-2012	LONG TERM: 2012-2018
Develop and implement a Technology Roadmap communication plan.	Adjust and modify the Technology Roadmap communication plan.	Adjust and modify the Technology Roadmap communication plan.
End reflection on an appropriate image for the Canadian textile industry (e.g. "nordicity," "Made in Canada," "Canadian quality").	Provide the industry with a brand image that reflects its distinctiveness and is recognized throughout Canada.	Provide the industry with a brand image that reflects its distinctiveness and is recognized internationally.



CONCLUSION

The textile industry in Canada is at a major turning point in its development. Faced with increasing foreign competition, the offshoring of its clothing sector clientele and the erosion of a number of its historical economic advantages (e.g. the weak dollar), many companies in the field have changed their business model, or even their commercial vocation. In such a context, the industry has sought to adopt a strategy for technological development. This coherent roadmap charts technological development for the next 10 years.

Drawing on the strength offered by its past experience and by the number of participants who took part in the Roadmap exercise, there is no doubt that the Canadian textile industry is gearing itself for growth once again. The demonstrated openness of manufacturers to initiatives such as networking, alliances and partnerships will enable companies in the sector to gradually embrace the race for new technological developments.

The Canadian industry has defined those growth sectors in which it has an interest in developing an expertise over the next 10 years. The industry has determined various market demand factors and consequently targeted technological development opportunities involving both acquired knowledge and innovation.

The observations and recommendations presented in the Roadmap are meant to provide the industry with all elements necessary for ensuring the success of its technological shift. By driving interaction at every point in the value chain, by encouraging innovation, by correcting the industry's image, by strengthening resources (human, financial), and by evaluating the obstacles to the commercialization of its products, the industry is committed to:

"INNOVATION THROUGH PARTNERSHIP"

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