



Report on ITS Inventory of Textiles R&D in Canada

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La Carte routière de l'industrie textile The Textile Industry Roadmap

*Une stratégie pour le futur
A Strategy for the Future*

www.textileroadmap.com



Snapshot of Roadmap Project

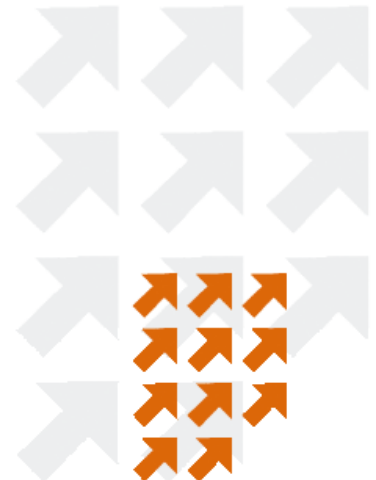
- **Collective input from 120 individuals from industry or partners**
- **11 months, 52 meetings, 11 workshops, and 1 survey**
- **Observations**
- **Recommendations**





Taken into consideration:

- Strengths & weaknesses
- Opportunities
- Threats
- **High-priority demand factors**
- Barriers to market demands





High-Priority Demand Factors

- Ageing population
- Worldwide demographic growth
- Geopolitical factors
- Environmental and sustainable development trends
- Government local-purchasing and business-incentive partnerships
- Trade regulations





Observations

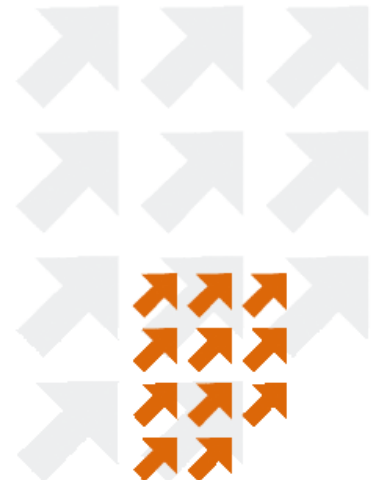
- 4 growth sectors: protection, medical, transportation, and construction applications
- Pay attention to R & D, funding human resources, access to markets, marketing and mastering information technology





Recommendations

- **Develop R&D, innovation & commercialization networks in partnership with universities, users and sectoral associations.**
- **Refine the human resources vision, textile education, and continuing education models.**





Purpose of Inventory

- **Respond to recommendations in Technology Roadmap – R & D.**
- **To gather descriptive information on the range of textile or textile related research conducted by researchers in Canada.**
- **Universities, non-profit research organizations, government.**



Process

- **Identify pool of researchers.**
- **Develop questionnaire.**
- **Administer questionnaire.**
- **Organize and analyze results.**



The Questionnaire

Section 1

- **Name**
- **Institutional affiliation**
- **Location of institution**

Section 2

- **Research projects from 2004 to 2008**

The Questionnaire – Section 3

Classify research using 12 textile applications originated by the Messe Frankfurt Group.

- Agrotech
- Buildtech
- Clothtech
- Geotech
- Hometech
- Indutech
- Medtech
- Mobiltech
- Oekotech
- Packtech
- Protech
- Sportech



Results



Number of Responses

- **44 questionnaires sent**
- **23 questionnaires returned**

Geographical Distribution of Responding Researchers (N=23)

Province	Number of Researchers	%
Quebec	10	43
Ontario	3	13
Manitoba	4	17
Alberta	3	13
Saskatchewan	1	4
British Columbia	2	9

Researchers in 12 Classifications of Textiles

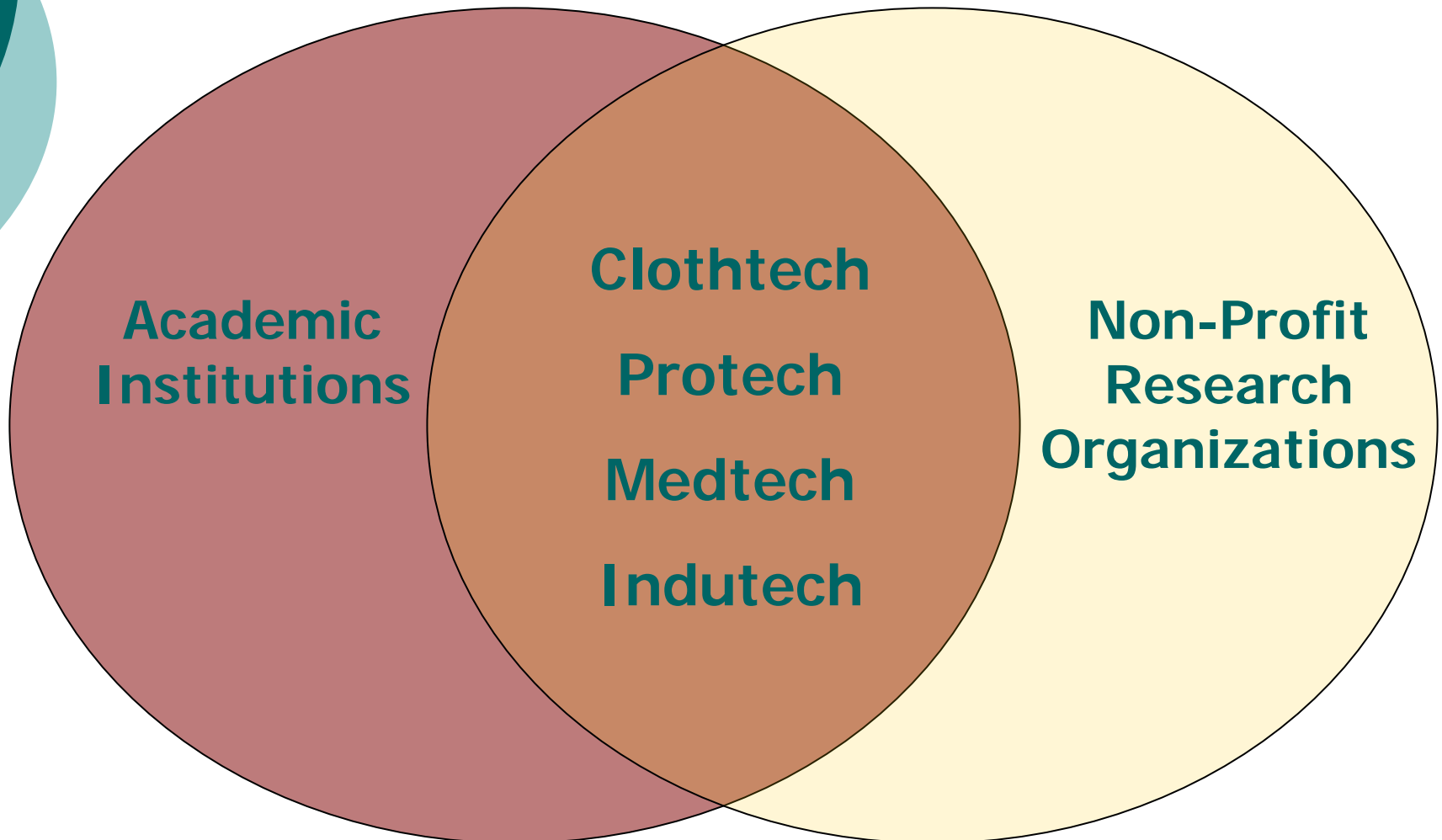
Clothtech	12
Protech	10
Medtech	7
Indutech	5
Mobiltech	5
Buildtech	3
Oekotech	3
Geotech	2
Hometech	2
Sportech	1
Packtech	1
Agrotech	1

Researcher Diversification

Number of Textile Classification	Number of Researchers
1	7
2	8
3	5
4	1
5	2

Classification	Number of researchers	Number of papers	Number of patents
Clottech	12	35	2
Protech	10	43	2
Medtech	7	18	4
Mobiltech	5	2	0
Indutech	5	14	0
Buildtech	3	13	0
Oekotech	3	15	0
Geotech	2	8	0
Hometech	2	3	0
Sportech	1	3	0
Packtech	1	0	1
Agrotech	1	0	0

Research themes common to academic institutions and research organizations





Research Projects – First Impressions

- **Engineering textiles for very specific end uses.**
- **Developing methods to measure very specific textile properties.**
- **Textiles as a non-traditional material for some end uses.**



As We Delve Deeper

- 1. Heat and flame**
- 2. Chemical and biological risks**
- 3. Mechanics and mechanical risks**
- 4. Comfort and functionality**
- 5. Structures and composites**
- 6. Aging**
- 7. Modeling**
- 8. Development of methods or standards**
- 9. User response to textile products**



Examples

Heat & Flame

- **Develop & evaluate fire shelter materials**
- **Clothing systems for protection from high pressure steam and condensate**

Comfort & Functionality

- **Textiles with plasma**
- **Textiles for illumination, sensing and information transmission**
- **Moisture management in underwear fabrics**

Examples

Modeling

- **Predict degree of thermal stress associated with protective clothing**
- **Correlate small and full-scale fire test results of mattresses**

Methods or Standards

- **Validate a method for measuring flexibility of gloves based on surface electromyography**
- **Develop standard and method for measuring thermally stored energy in protective clothing system**



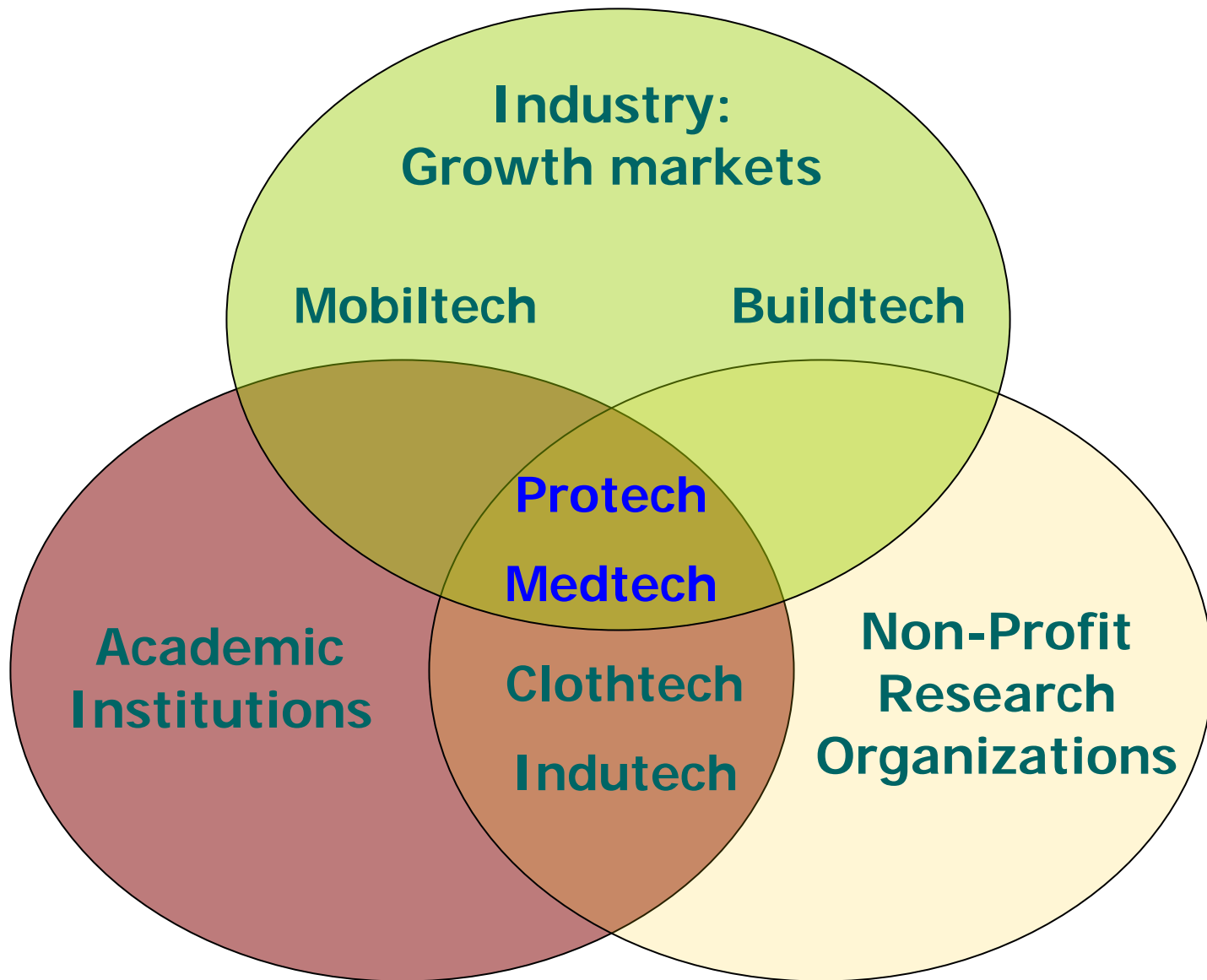
Conclusions

Canadian scientists conduct research in all 12 areas of textile application



- Clothtech
- Protech
- Clothtech + Protech
- Medtech

- Clothtech
- Protech
- Medtech
- Indutech
- Mobiltech
- Oekotech



Areas of research align with growth markets identified in the Technology Roadmap.

Research projects

1. Heat and flame
2. Chemical and biological risks
3. Mechanics and mechanical risks
4. Comfort and functionality
5. Structures and composites
6. Aging
7. Modeling
8. Development of methods or standards
9. User response to textile products

**Create value
added products**



**Competitive
advantage**



Recommendations



Working Together Rather Than Apart

- **Encourage academic institutions and non-profit research organizations in Canada to join forces to pursue innovations in growth areas**
- **Establish a global network to align R&D efforts by researchers and the industry**



Update R & D Inventory Regularly

- **The Institute of Textile Science can play a role in maintaining inventory of research and researchers in textiles**



Re-define Boundaries of Textiles Education in Canada

Forum for dialog among:

- **Educational institutions**
- **Textile industry**
- **Textiles Human Resources Council**
- **Government**
- **Non profit research organizations**



Acknowledgement

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Ms. Laurel Martin