

February 10, 2006

A Report to the BC Competition Council

Manufacturing

Driving into the future



From the Manufacturing Industry Advisory Committee

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Key Facts

- Manufacturing directly accounts for 12.1% of the provincial economy.
- Every dollar of manufacturing output in BC generates \$3.01 in total economic activity.
- More than 400,000 jobs depend on manufacturing – one in every five workers.
- Over 94% of manufacturing jobs are full time and wages are 24% higher than the provincial average.
- Manufacturers invested over \$475 million in 2004 new technologies and production facilities.
- BC manufacturers dominate exports, producing and shipping goods valued at \$24 billion in 2004, some 60% of all exports and 75% of merchandise trade.
- 77% of manufacturers are SMEs and they exist in every community in BC

Overview

In its 2005 Throne Speech, the Government of British Columbia announced a new BC Competition Council to review the province's competitiveness both on a sectoral and regional basis. In turn, the Council established the Manufacturing Industry Advisory Committee (MIAC) to review the state of the manufacturing sector in British Columbia and to recommend workable private and public sector actions to attain sustainable competitive advantage for the province.

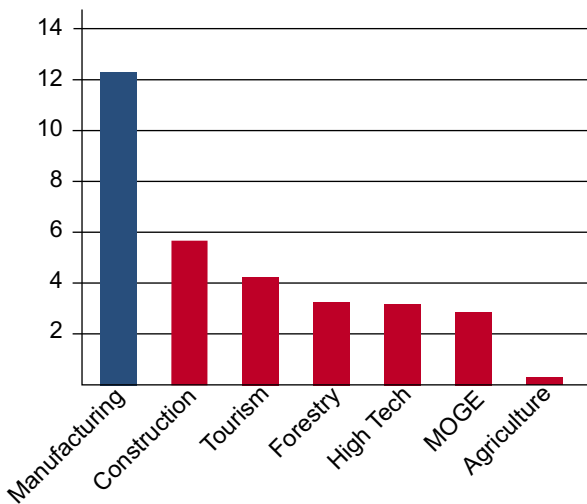
Manufacturing: Driving into the Future

provides a review of the present state of the BC manufacturing sector, considers the future for advanced manufacturing, outlines opportunities and challenges facing these firms in the province and defines the priority actions that should be taken by both government and industry. These actions will allow advanced manufacturing in British Columbia to continue to drive the economy of the province and support its efforts to develop a sustainable economy over the long term.

This report speaks to the power of manufacturing as a whole, but the discussion and recommendations focus primarily on advanced manufacturing operations that produce high value-added products in BC. Other sector groups will be addressing the specific requirements of resource-based primary manufacturers.



Manufacturing Drives the BC Economy



Source: BC Stats

“I understand manufacturing, how to make a movie, finance a movie and distribute a movie”

William Vince – Infinity Media, Vancouver Sun, October 29, 2005

Manufacturing has the “biggest economic footprint” in the province...

Manufacturing represents 12.1% of the province’s Gross Domestic Product, which compares to 4.0% for tourism and 3.2% for High Technology. The sector’s GDP grew 7.8% in 2004, almost twice as fast as the provincial economy as a whole.

Every individual, every business, every organization in BC depends on manufactured goods. Manufacturing has 21 different sub-sectors, spread through-out every community in BC, with more employees per firm and with large economic multipliers.

Every manufacturing job creates another 0.9 jobs elsewhere in the economy and every \$1 spent in manufacturing creates an additional 80 cents of GDP in supplier industries and generates a total of \$3.01 in total economic activity in BC.

Today’s manufacturing is a core element of the new economy. Manufacturing must remain a powerful wealth generator so it can continue to be a major part of rising living standards across the Province. Manufacturing is vital to the British Columbia economy...

Manufacturing is vital to the British Columbia economy...

Manufacturing in British Columbia is a touchstone of our economy and is at the forefront of the knowledge revolution and the globalization of business activity – the key forces that are transforming economies around the world.

With over 208,000 people employed directly in manufacturing, the sector led BC growth in 2004 and has increased by 23.8% in the last decade – the fastest growing industrial sector.

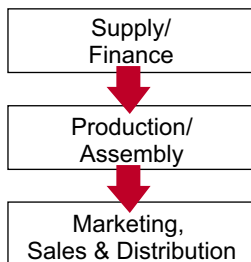
Manufacturing generates over 30% of the tax revenues paid by businesses to all levels of government.

Manufacturing records strong productivity growth. Productivity or real GDP/hour worked in manufacturing was up 6.3% in BC 2004 and has averaged growth of 3.6%/year since 1996 - double the provincial average. These productivity improvements enhance the prosperity and living standards of all our citizens.

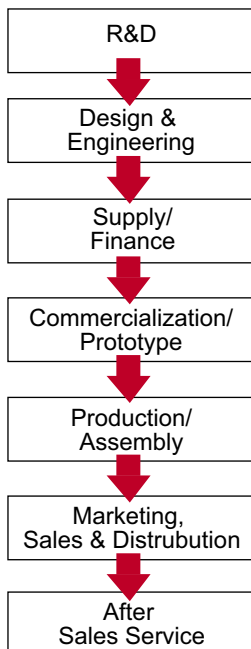


Manufacturing is a Value Chain

Traditional Definition



Modern Definition



Manufacturing is a major contributor to innovation in BC. Investment is up 86% over the past two years; while manufacturers are the province's leading researchers, funding 42% of all private sector R&D and employing over 3,000 people.

Manufacturing firms are distributed across the province and are the main source of jobs in many British Columbia Communities. Manufacturing represents the largest employer in many rural communities, especially in the north.

Provincial exports of manufactured goods have grown by over 90% since 1990 and totalled \$24 billion in 2004. Manufacturing accounts for 75% of BC's merchandise exports and 60% of total exports of goods and services.

Advanced manufacturing is changing the face of the economy, representing 45% of total manufacturing in 2004, growing at an average rate of 8.9% since 1990 and increasing its proportion of exports from 25% in 1990 to 37% in 2004.

Manufacturing Is...

The business of embodying value for customers in tangible goods or products. Manufacturing is about making things; but, it is much more than that. Manufacturers no longer see their activities simply in terms of transforming raw materials into components or finished products. Today, manufacturing is a business system encompassing all the activities that are required to deliver products that meet customer needs – a system that extends from research and development, design and engineering, to production, finance, sales and marketing, and after-sales service. It is a system that extends beyond any single enterprise, across supply chains and business networks that are increasingly global in scope and that incorporate services as well as production activities.

Companies like Robo Coaster Ltd., QuestAir Technologies Inc. or Omnyx Control Systems are selling high value added and specialized technologies around the world; firms like Teleflex Energy and Whitewater Composites have restructured their operations and product lines to become world leaders in their fields of expertise; and companies like Unifiller Systems Inc., Thiessen Team and Nicholson Manufacturing Ltd. are pursuing excellence in their day-to-day operations. Firms like FTS-Forest Technology Systems and Rimex Supply Ltd. are providing integrated solutions - selling products with services included, while firms like International Parkside Products and ACDEG International Inc. operate virtual manufacturing businesses that sell products around the world. And of course, manufacturing firms like Lions Gate Films (film, video) and Electronic Arts (software, games) are creating and selling products that don't involve chemical or physical transformation.

A revolution is underway...

A new paradigm is emerging as enormous changes occur in the global market, new technological capabilities emerge, and the re-organization of manufacturing enterprises takes place. **Past progress doesn't ensure future success.**

The new paradigm will transform all aspects of the business. To compete and grow their businesses, BC manufacturers will have to be fast, flexible, innovative, reliable, quality- and service-oriented, low cost, and aligned squarely behind the objective of customer success. In turn, BC firms will demand the same enabling qualities from their suppliers and business partners, as well as from the business environment in which they operate.

A New Paradigm for Manufacturing

Traditional Manufacturing	Advanced Manufacturing
<p>Customers & Markets</p> <ul style="list-style-type: none"> • Domestic/North American market • Customers sourcing locally • Production push • Mass markets • Competing for market share • Higher costs are passed to customers in higher prices • Prices determined by local competition 	<p>Customers & Markets</p> <ul style="list-style-type: none"> • Global markets • Customers sourcing globally • Customer pull • Niche markets/individual customers • Competing for markets, investments, product mandates • Higher costs have to be absorbed – prices are falling • Prices set by disruptive global competition
<p>Products</p> <ul style="list-style-type: none"> • Value based on products • Competitiveness based on cost, quality, time to market 	<p>Products</p> <ul style="list-style-type: none"> • Value based on service • Time is now the premium, but customization, service – price competitiveness is more important than ever
<p>Operations</p> <ul style="list-style-type: none"> • Efficiency drives competitiveness • Local purchasing & materials handling • Mass production • Growth through higher volumes • Static production processes • Stand alone discrete technologies • Mechanical processes • Long production runs • Cost cutting • Sequential product development • Pollution control • Well established marketing channels 	<p>Operations</p> <ul style="list-style-type: none"> • Innovation drives competitiveness • Managing a global supply chain • Mass Customization • Growth through innovation • Flexible production systems • Integrated technologies • Automated processes • Short production runs • Waste elimination • Complex systems • Environmental sustainability • Myriad new marketing channels and extensive use of the internet
<p>Organizations</p> <ul style="list-style-type: none"> • Corporate organizations • Companies compete • Internal performance standards • Manual skills • Work under specifications • Functional materials, products, processes • Production management • Reactive governance 	<p>Organizations</p> <ul style="list-style-type: none"> • Business networks • Supply chains compete • World-class benchmarks • Knowledge based skills • Problem solving • Smart materials, products, processes • Life cycle management • Proactive governance



The Need to be World Class...

As globalization transforms economies over the coming years, BC manufacturers will need to accelerate their efforts in the race for innovation and productivity improvement. As our companies compete head-to-head with countries around the world and strive for excellence, they will fundamentally change the nature of manufacturing. Being world-class will become the norm to survive, but BC firms haven't arrived.

A significant excellence gap has opened up between the average performance of British Columbia's manufacturing sector and its major international competitors (G7 economies).

BC tops the G7 group in growth in manufacturing production over the period 1997-2004, but fails the grade in exports, productivity and investment. Overall, BC gets a barely passing grade of 54% and falls well short of its main competitors - especially the U.S., which scores 79%.

BC's exports drive the provincial economy. While **export growth** was up 10% in recent months, BC's export performance over the past seven years has trailed their G7 counterparts, and is well behind emerging nations like China, India, and Mexico, where output volumes have increased at average annual rates of 12.4%, 7.4%, and 4.6% respectively.

BC's Excellence Gap Benchmarking BC's Performance 1997-2004

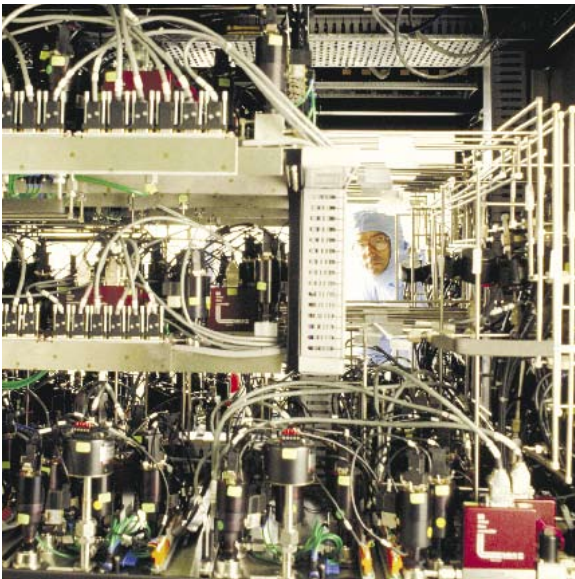
Indicator	G7 Leader	Benchmark	Canada	British Columbia
Production	Canada	3.6%	100%	125%
Exports	Germany	6.4%	70%	22%
Productivity (output per hour)	United States	8.0%	38%	44%
Unit Labour Costs	Japan	-2.4%	41%*	59%*
Investment in New Technology	Japan	16.1%	43%	43%
Investment in R&D	Japan	2.1%	55%	33%
Average	G7	100%	58%	54%

* Percent calculated across range of G7 performance.
Source: OECD Annual Statistics, various

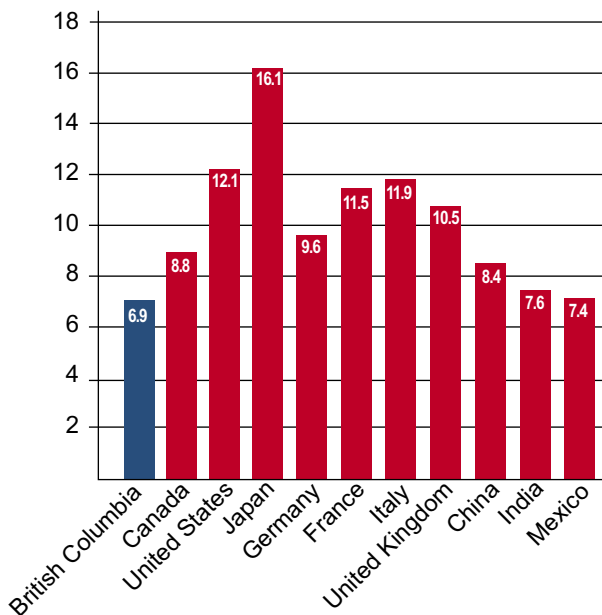
BC labour productivity growth during the period has exceeded Canada (3.5% versus 3.0%), but its **performance has lagged** the best of the G7 and is well behind the United States. BC even lags key emerging industrial economies like China, India, and Mexico. The failure of BC manufacturers to implement the principles of continuous improvement or "Lean Thinking" in all aspects of their business and production systems slows productivity growth, constrains cash-flow and restricts further investment in new technology.

BC's **unit labour costs** are helping make the province more competitive than Canada, but our competitors' unit labour costs are declining more quickly due to higher productivity and better efficiency.

While BC's manufacturing sector is the province's largest R&D investor, its **investment growth is falling** behind the best in class amongst its G7 competitors. At 0.7% growth in R&D investment, BC is well below the benchmark rate of 2.1% per annum growth set by the Japanese. BC manufacturers find it difficult and too costly to commercialize new products to meet customer needs.



Manufacturing Investment in New Technology 1997-2004



“By 2020, there will be more change in the way we work and the way we do business in Canada than we have witnessed over the past 40 years.”

Kelowna manufacturer, September, 2004

BC’s **investment in technology is flagging**. On average, BC manufacturers invested 6.9% of their GDP (value added) in new technologies, machinery, and equipment between 1997 and 2004, lower than the 8.8% for Canada’s manufacturing sector and the lowest amongst all BC’s competitors, including emerging nations like Mexico and India.

To succeed in the Golden Decade, BC manufacturers will need to accelerate their efforts in the race for innovation and productivity improvement.

Achieving Global Excellence...

BC manufacturers are competing in a global marketplace where the pace of doing business is red hot, the competition is intense, the name of the game is adding value, and where innovation is the key to success. BC manufacturers believe the province needs a dynamic vision based on global excellence and a coherent and integrated approach to managing change. Responding to the future challenges of the global marketplace will demand new strategies, and new ways must be found to get things done.

The challenge for British Columbians is to not just to live in the best place in the world, but to live in the best and most prosperous place in the world. Our economic prosperity will, in turn, depend on our ability to grow the high-value, high-paying activities that are part of the modern business of manufacturing in this province.

Priorities for Action

In the G7 competition, BC ranks second last and is well behind the leaders. To get to first, manufacturers across BC are calling for immediate practical actions rather than more words. There is urgency, because manufacturers are at the forefront of the global revolution that is transforming the economy and will bring radical change over the next ten to fifteen years.

Manufacturers believe that they need to take the lead in defining their future, to set stretch goals, and to establish benchmarks for progress in achieving the critical factors that will ensure their business success. However, success will not be possible without the support and assistance of governments at all levels along with other key stakeholders including academia and labour. Everyone has a vital role to play in determining our future.



“We must have an industrial strategy. We have to decide where our region will carve out its niche in this globalized economy, so we can continue to create and grow manufacturing jobs that pay family-supporting, wages.”

Ken Georgetti, CEO- Canada Labour Congress in Ottawa Life, October, 2005

In order to sustain a dynamic and accelerating economy that eliminates the excellence gap and brings BC to the top of the class, BC manufacturers urge priority be given to the following four areas:

A. Leadership and Vision

“BC needs an independent and respected leadership forum to define a shared globally competitive vision for BC’s Industrial Sector.”

BC will face far-reaching economic adjustments over the next ten to fifteen years. To eliminate our excellence gap and achieve our potential, the pace of change and growth in this area will need to be faster than the competitors. Narrow, sector-specific strategies aren’t sufficient. A broad-based and more comprehensive approach is vital because every aspect of the BC economy and the lives of its citizens are intertwined with manufacturing. The lack of close interaction between business, government, labour and academia is also a huge impediment to innovation and to fostering a true innovation and knowledge-based culture in BC.

Leadership will be fundamental to responding to the challenges and the opportunities that face industry and everyone will need to be pulling together. Business strategies, public policies and programs must be coordinated and aligned in a shared vision for BC. Better communication, co-ordination and collaboration are essential to global excellence.

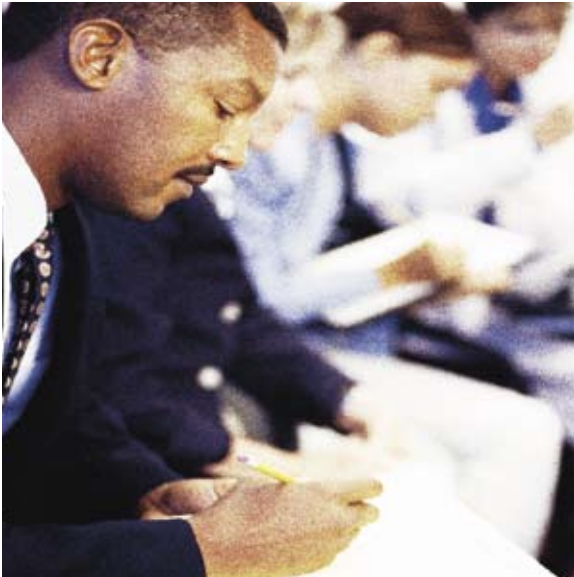
In order to be best-in-class,

Government needs to:

- Acknowledge the importance of creating a shared globally competitive industrial vision for BC by establishing a non partisan independent organization to lead its development. Once developed, the organization should be mandated to provide strategies for achieving the vision within the context of a continuously changing global competitiveness landscape. Governments need to participate in and financially support this organization.

Manufacturers and the other industry sectors need to commit to:

- Lead the independent organization, help fund the organization and work with governments and other stakeholders at all levels to build the Vision and make it a success.



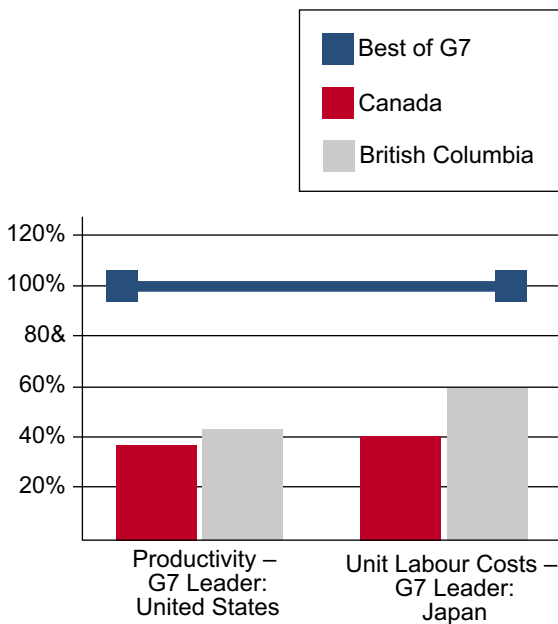
B. Workforce Capabilities/ Skills Development

“The province’s workforce must be ready and able to meet the future requirements of manufacturing.”

Available and qualified personnel are critical to BC’s efforts to expand its innovation activities, fundamental to meet changing business practices and a significant factor in a firm’s location decisions. BC manufacturers need more workers with the basic skills required for the job, more with business skills and more with practical experience.

BC manufacturers invest about 2.4% of payroll in formal skills training – or approximately one-half of the amount invested in Japanese manufacturing and three-quarters of that invested in the U.S. Ways need to be found through tax and other incentives to encourage manufacturers to invest more in continually upgrading the skills and capabilities of their workforce and for their workforce to be encouraged to continuously upgrade their skills. The province’s workforce must be ready and able to meet the future requirements of manufacturing.

Manufacturers and governments need to strengthen collaborative efforts in skills training, expand their apprenticeship training and develop more effective labour/employment relations practices to encourage retention and expansion. And there needs to be both an improved immigration system to more effectively attract new Canadians as well as improvements to collaborative efforts between government and business to encourage more immigration.



Source: Statistics Canada

As a major part of closing the gap on labour productivity and unit labour costs...

Manufacturers need to:

- Increase investments in skills upgrading to help eliminate the performance gap. The initial target should be to double their investment in formal and informal skills training from 2.4% of payroll or \$200 million annually to 5% of payroll or \$400 million annually by 2010.

Governments need to:

- Provide tax incentives to encourage manufacturers to implement firm specific training and to encourage workers to take skills related training. Tax incentives have been used successfully in Ontario, eighteen U.S. states and many European nations to stimulate training investments.



C. Innovation

“British Columbia manufacturers must become G7 leaders in all aspects of innovation, including flexibility, and continuous improvement.”

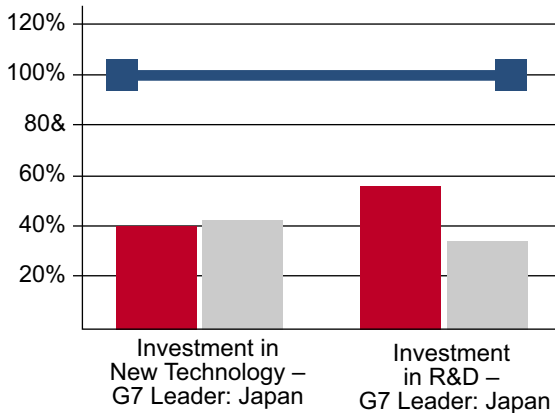
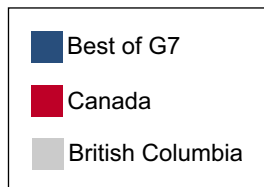
Innovation is key to success in global markets. BC manufacturers need to at least double the pace of their innovation and investment in R&D. They need to strengthen their ability to undertake the commercialization needed to bring new and improved products and services to market. They need to be able to spread the value of technology more quickly across firms. Technological diffusion is critical. BC manufacturers feel the need to increase the speed at which they adopt new technology in order to increase productivity and improve provincial prosperity and certain tax incentives like accelerated depreciation allowances can give industry that boost

BC manufacturers need to move more quickly to implement continuous improvement in all aspects of their business and production systems in order to improve efficiency and reduce costs.

Governments need to support and encourage these efforts at continuous improvement because they drive productivity and prosperity.

In order to be “best-in-class”, Manufacturers need to:

- **Significantly increase their R&D investment across the province.** The initial target should be to increase investment to \$750 million annually by 2010 and to \$1 billion annually by 2015.
- **Significantly enhance their investment in technology and engage in a widespread adoption of the principles of continuous improvement (Lean Thinking) across all sub-sectors.** The initial target should be to match the growth of emerging nations (12.1%) by 2010 and to become the benchmark leader by 2020.
- **Produce annual benchmarking reports on the success of BC manufacturers against their G7 competitors.**



Source: Statistics Canada



Governments need to:

- **Provide tax incentives similar to SR&ED credits that extend financial support to product commercialization and process improvements.** These incentives should complement existing tax incentive systems for innovation and be administratively efficient.
- **Provide accelerated depreciation allowances through the entire “system of production” to allow firms to continuously upgrade their technology, remain flexible and successfully compete.**

D. Business Environment

“British Columbia must become a preferred location in North America for businesses to locate, invest, manufacture, export from, employ, and grow.”

The BC Government’s efforts at creating a competitive tax environment are encouraging and 76% of BC manufacturers feel more optimistic about the BC business climate as a result. However, resources today flow to the most competitive jurisdictions and BC still ranks fourth in Canada and 16th amongst its main competitors. Further efforts to improve tax competitiveness are essential to future success.

Reform in municipal taxation is an urgent need as local tax rates are punishing manufacturers in many BC communities and are negatively impacting on the ability of firms to invest in new plants and equipment. As well, the provincial sales tax system continues to impact negatively on many manufacturers and reform is required.

The BC Government’s present commitment to regulatory reform has been well received by the BC manufacturing community, but greater effort is needed. BC manufacturers want to see a formal and ongoing commitment to the principles of continuous improvement. They want an ongoing “lean regulation” system that simplifies compliance requirements, reduces regulatory duplication and overlap, increases regulatory harmonization - especially with the US, reduces reporting requirements and increases the speed of approval’s processes. BC manufacturers need greater awareness of the rules and regulations governing cross border trade and greater effort needs to be made to make North America a seamless distribution system.

British Columbia is the Pacific Gateway to North America, but to reach its full potential Governments need to increase their investments in the Gateway and ensure that the entire global supply chain works seamlessly in both directions.



Manufacturers need to:

- Fund independent research on the impacts the tax and regulatory environment on the sector.
- Provide annual global competitiveness benchmark reports of BC manufacturers.
- Provide annual benchmark reports on municipal taxation of business.

Governments need to:

- **Ensure the marginal effective tax rate on manufacturing investments in BC is among the best two provinces in Canada.** The government should target reform of the Provincial Sales Tax and Municipal taxation systems by 2008.
- Commit to making BC the most efficient and effectively regulated region amongst the G7 by 2020.
- Ensure BC is acknowledged by the G7 as having an efficient and effective infrastructure system by 2020.

British Columbia's manufacturers stand at a critical crossroads...

British Columbia is one of the most prosperous and richly endowed regions in the world and a place often designated as the "best place to live" on earth. We enjoy a wealth of natural resources, proximity to the world's largest market, a stable legal and political system, well-developed infrastructure and highly educated and highly skilled workers. We have built our standard of living on the strength of our primary resource industries, the successes we have achieved in manufacturing, and the capabilities of our commercial and services sectors.

The Manufacturing Industry Advisory Committee believes British Columbia's manufacturing sector will be key to sustaining and increasing this province's economic prosperity. Its strategic role in the economy, as a direct contributor to high paying jobs, an engine of growth for other sectors of the economy, and a generator of earnings from abroad, ties future prosperity inseparably to a successful manufacturing base.

Part 1: Building a Strong Economic Future

A New Playing Field

British Columbia is one of the most prosperous and richly endowed regions of the world. Our province enjoys a wealth of natural resources, proximity to the world's largest market, a stable legal and political system, and one of the strongest fiscal regimes in the world. B.C. has well-developed infrastructure with respect to transportation, communication, and energy, education, health care, and income support. Our citizens are highly educated and highly skilled. We have built our standard of living on the strength of our primary industries, the successes we have achieved in manufacturing, and the capabilities of our commercial and services sectors.

Our future economic prosperity, however, is not assured, especially in the face of the challenges and changes that lie ahead in the global marketplace. The world is moving to a New Playing Field where two major market forces will fundamentally transform the nature of business and the wealth creating potential of our economy in the next decade:

“By 2020, there will be more change in the way we work and the way we do business in Canada than we have witnessed over the past 40 years.” Kelowna manufacturer, September, 2004

- The first is a **shift in the way that value is created** – away from growing, extracting, and producing things toward the specialized application of knowledge in fulfilling the needs of ever more demanding customers;
- The second is the emergence of a more **integrated global economy** with trade and investment, communication networks and business organizations, industrial and financial markets, competitive challenges and opportunities extending around the world.

Both of these market forces herald a new era of economic restructuring. The economic adjustments that will take place over the next ten to fifteen years promise to be even more challenging and far-reaching than those following North American Free Trade.

We can build on the basis of our natural endowments and our past success, but we must not become mesmerized by them. New policies, new business strategies, and new work practices will also be required to build the capital and workforce capabilities that will enable British Columbians to capture the value inherent in knowledge and take advantage of the economic opportunities that the world has to offer.

Manufacturing will be critical to retaining and sustaining a prosperous BC economy. Every individual, every business, every organization in this province depends on manufactured goods. Manufacturing is the largest business sector in the province, contributing directly to employment and economic growth and is an important source of demand for products and services from other industries. The research and development conducted by manufacturers, along with innovation and productivity improvements they generate in the province, enhance the prosperity and living standards of all Canadians. In large part, BC manufacturers create the wealth that sustains the social programs, education, and health care that we value.

To sell their products in the future, BC manufacturers will need to incorporate both global vision and global excellence.

Manufacturing – Turning Ideas Into Reality...

Manufacturing is about making things; but it is also much more than that. Manufacturers no longer simply transform raw materials into components or finished products; they provide solutions to ensure customer success. Manufacturing is the business of embodying value for customers by turning ideas into tangible goods and services.

Today manufacturing is a business system encompassing all the activities that are required to deliver products that meet customer needs – a system that extends from research and development, design and engineering, to production, finance, sales and marketing, and after-sales service. It is a system that extends beyond any single enterprise, across supply chains and throughout business networks that are increasingly global in scope. Equally important to note is that modern manufacturing incorporates services as well as production activities.

Manufacturing is... "the systematic process of production" -- whether the end product is a "thing" turned out in a factory, an "intangible" such as software, or a "service," such as a mutual-fund share."
Peter Drucker-Managing the Next Society, 2004

Manufacturing is a Value Chain

R&D	Design & Engineering	Commercialization/ Prototype	Supply/ Finance	Production/ Assembly	Marketing, Sales & Distribution	After Sales Service
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_Traditional Definition _

----- _Modern Definition - -----

"FTS manufactures environmental monitoring equipment, but our business is really providing a fully integrated service to help organizations around the world manage their forests." *Craig Williams President- FTS Forest Technology Systems*

Companies like Robo Coaster Ltd, Questair Technologies Inc. or Omnyx Control Systems are selling high value added and specialized technologies around the world; firms like Teleflex Energy and Whitewater Composites have restructured their operations and product lines to become world leaders in their fields of expertise; and companies like Unifiller Systems Inc., Thiessen Team and Nicholson Manufacturing Ltd. are pursuing excellence in their

day-to-day operations. —Firms like FTS-Forest Technology Systems and Rimex Supply Ltd. are providing integrated solutions - selling products with services included, while firms like International Parkside Products and ACDEG operate virtual manufacturing businesses that sell products around the world. And of course, manufacturing firms like Lions Gate Films (film, video) and Electronic Arts (software, games) are creating and selling products that don't involve chemical or physical transformation.

...Manufacturing is Evolving

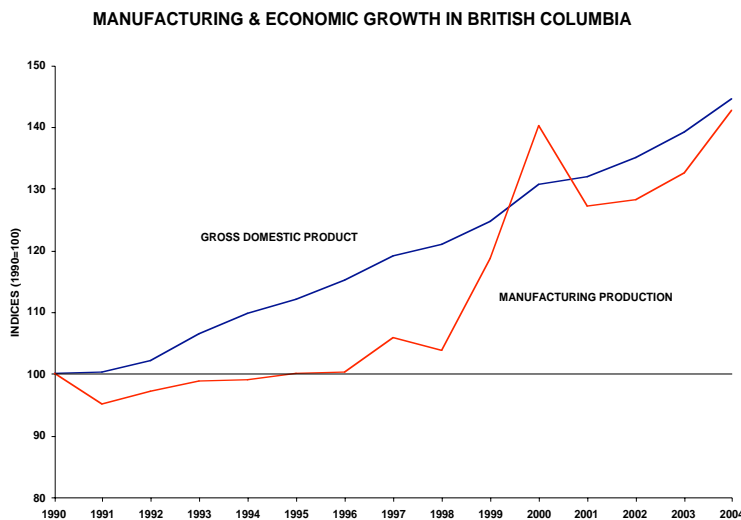
Manufacturing is rapidly evolving today in the face of competitive challenges, new market opportunities, and global trends that are redefining the industry. Customers now demand products that exactly fit their needs, while having high quality, low cost and fast delivery. To accommodate these demands the manufacturing world is moving from mass production to

"At Dell we create custom made computers for the masses."
Michael Dell, Chairman Dell Computers

“mass customization”, a process that combines the advantages of producing larger quantities at lower costs, with the flexibility of individual customization. Dell Computers, for example, allows every customer to specify a computer unique to their needs, while Motorola has more than 29 million variations of its "Bravo" pager to allow every customer to have their own personal pager manufactured the same day.

Across BC and throughout Canada, the pace of this evolution in manufacturing has quickened since the advent of freer trade across North America in 1989. Today it is accelerating even more rapidly thanks to the emergence of new technology, new competitors and new markets around the world. BC manufacturers will only succeed if they embrace a global vision, engage in global competition and incorporate global excellence into their operations.

Manufacturing is Vital to the BC Economy....

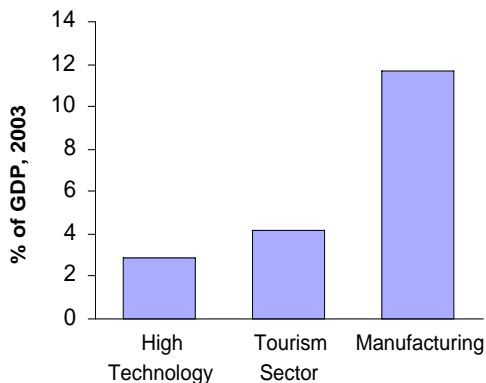


British Columbia's manufacturing sector is the province's largest industrial sector, contributing directly to employment and economic growth.

BC manufacturers increased their GDP by 7.8% in 2004, almost double the growth of the economy as a whole.

Manufacturing production has grown 43% since 1990 and has been surging since 2001. (Production volumes reflect the value added by manufacturers after discounting price changes)

Manufacturing directly accounts for 12.1% of provincial Gross Domestic Product and 49% of goods producing GDP.¹



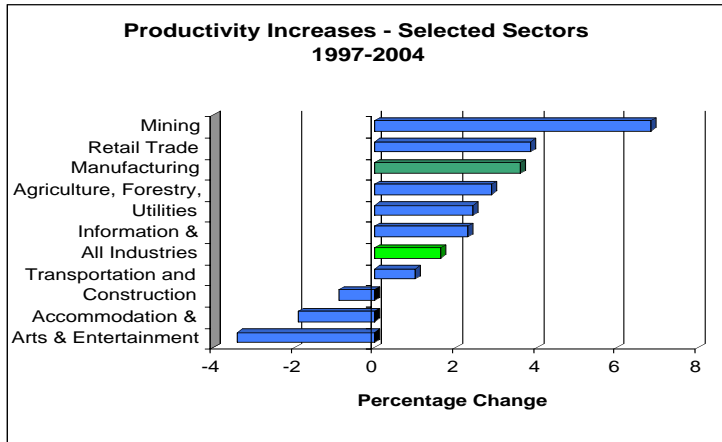
By contrast, the tourism sector accounts for just over four percent of GDP, while the high technology sector, which also incorporates a substantial manufacturing component, contributes 2.9% of British Columbia's GDP.

Manufacturing contributes to the economy as a source of high paying jobs, personal savings, and consumer spending. Profits made in the sector are channelled into capital investments in construction, machinery, and equipment. Manufacturing also generates over 30% of the taxes revenues paid by businesses to all levels of government.

¹ Gross Domestic Product or GDP is a measure of total output or value added in the BC economy.

...With the Biggest Economic Footprint in the Province...

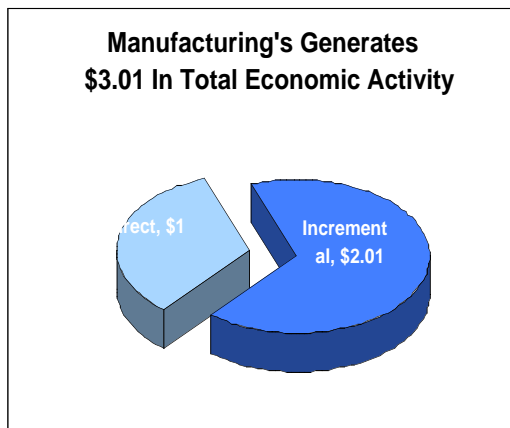
Manufacturing is driving improvements in productivity and lifting the BC economy.



Productivity or real GDP/hour worked in manufacturing was up 6.3% in 2004 and has averaged 3.60% per year since 1996. This is well above the overall provincial increase of 1.7% in 2004 and 1.66% per annum growth since 1996. This contrasts with the services sector, which faced productivity declines in many areas between 1997 and 2004. Information and culture productivity declined an average of 2.41% per annum between 1997 and 2004, with declines of 1.8% in accommodation and food services and 3.4% in arts and entertainment.

Computer manufacturers saw productivity increases of 12.8% per annum for the last decade, while furniture manufacturers' productivity was up an average of 9.2% per annum and machinery equipment firm productivity was up 5.8% per annum.

Manufacturing creates significant indirect and induced economic impacts or "multipliers"² through its demands for goods and services in other sectors – from primary resources and energy production, to transportation, financial, communications services, to legal, health and accounting, to business management, design, engineering and high technology support.

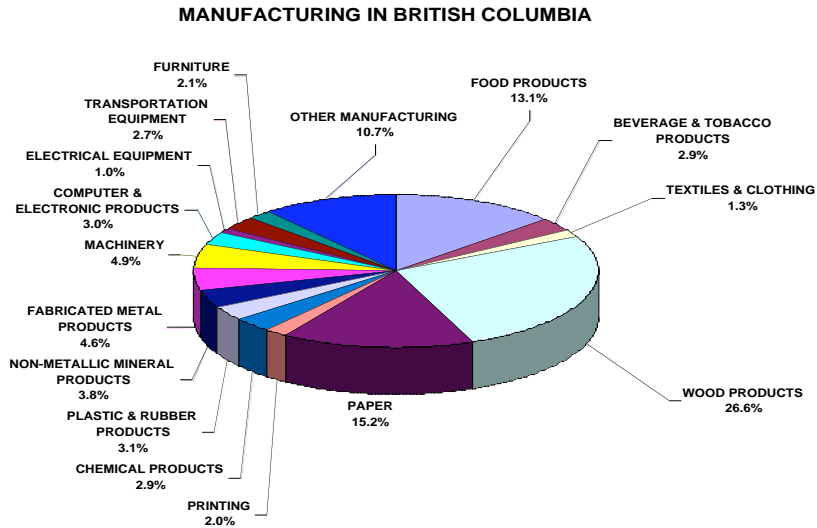


- **Every manufacturing job creates another 0.9 jobs elsewhere in the economy.**
- **Manufacturing creates an additional 80 cents of GDP in supplier industries and generates a total of \$3.01 in total economic activity in BC,** more than any other industry group. The indirect economic contribution made by manufacturing has grown over time as more products and services originally produced by manufacturers themselves are being outsourced to other business sectors.

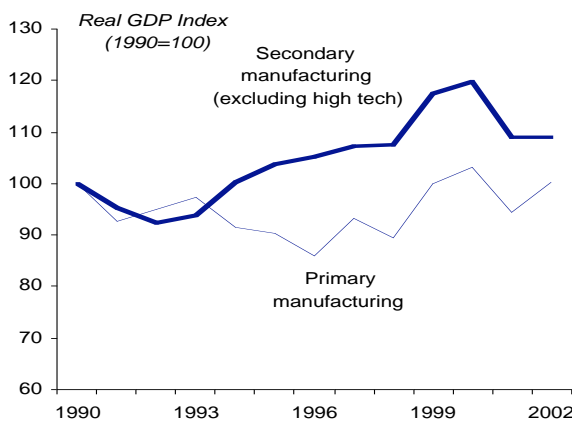
⁴Data is derived from BC Stats input-output table for British Columbia. A document explaining the concept of economic multipliers is available from BC Stats web store online at www.bcstats.gov.bc.ca

A Diverse Sector...

Manufacturing is a diverse sector that is part of every British Columbian's daily life. Manufacturing in BC encompasses 21 industry groups, ranging from industrial sectors like telecommunications equipment, computers, and aerospace to more consumer products industries like plastics, vehicles, appliances and machinery, to value added resource industries such as food, pulp, paper and lumber³.



.....With a Strong Advanced Manufacturing Component.



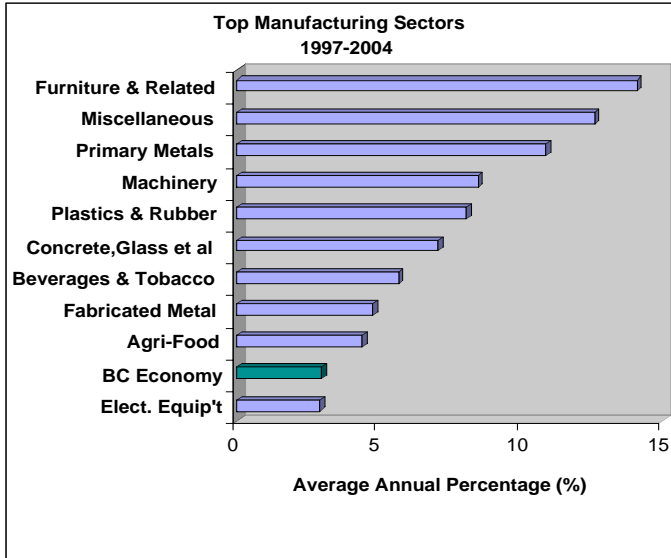
While most British Columbians associate manufacturing with the primary producing sectors like forestry and agriculture, **advanced manufacturing**⁴ represented 45% of total manufacturing in 2004.

Advanced manufacturing adds value to products and has assumed a larger role in the BC economy in the past decade.

Advanced manufacturing has grown an average of 8.9% per annum since 1990, establishing a more diversified and stable base for the province.

³ BC Stats, "BC Opportunities Profile-Manufacturing", pg.2 and the Appendix to the report provide a detailed listing of the sub-sectors that comprise manufacturing.

⁴ Due to data constraints, advanced manufacturing is defined here as the secondary manufacturing component of the manufacturing sector, although many primary producing operations involve the use of advanced technology as part of the production process.



Advanced manufacturing industries are also amongst the fastest growing in the province, with very positive future trends. For example, furniture and related products has been growing at 14.1% per year on average, while medical equipment and sporting/ athletic goods segments are up 12.6% over the same period. In fact, nine advanced manufacturing components had growth rates that exceeded the growth of the provincial economy over the past eight years.

By comparison wood products grew only 1.7% per annum and paper products were up only 0.6%.

A Major Employer....

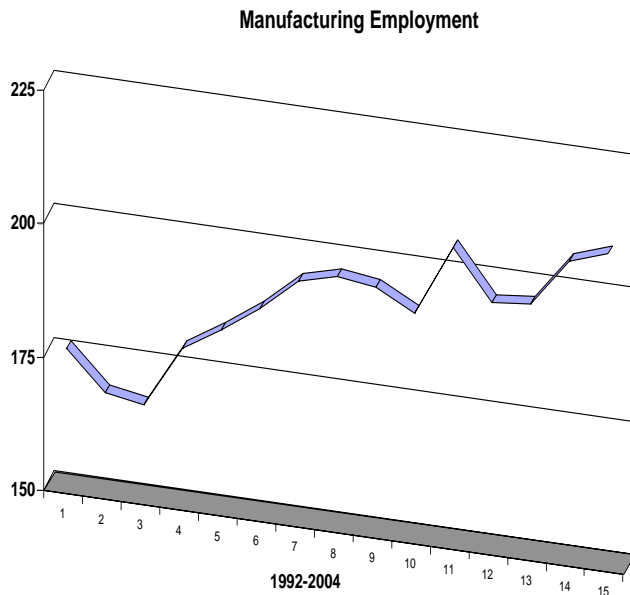
BC's manufacturers are major employers in the province with **more employees per firm than other industries**.

One out of every five jobs in BC depends on manufacturing.

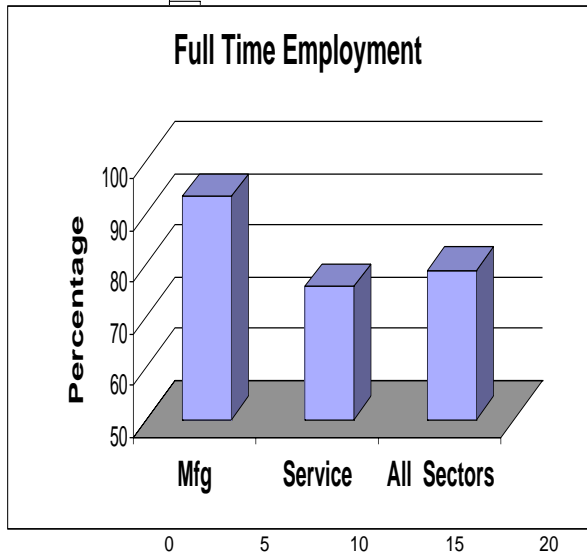
Manufacturers directly employed more than 208,000 people in 2004, and 187,200 additional jobs are directly dependent on manufacturing.

Manufacturing employment led growth in 2004 and has increased by 23.8% in the last decade, exceeding the rate of all other goods producing sectors.

Manufacturers employ more people per firm. 24% of manufacturing



establishments have at least 20 employees, which is almost double the number in the economy as a whole. Similarly, manufacturers have twice as many firms with at least 200 employees (2% versus 1% for the economy as a whole).



Regional Employment as a % of Total Employment, 2004

Source: Statistics Canada

...With High Paying Full-time Jobs.

94% of employees in manufacturing work full-time (at least 30 hours per week), while only 79% of the overall workforce is employed full time and less than 76% of services jobs are full time.

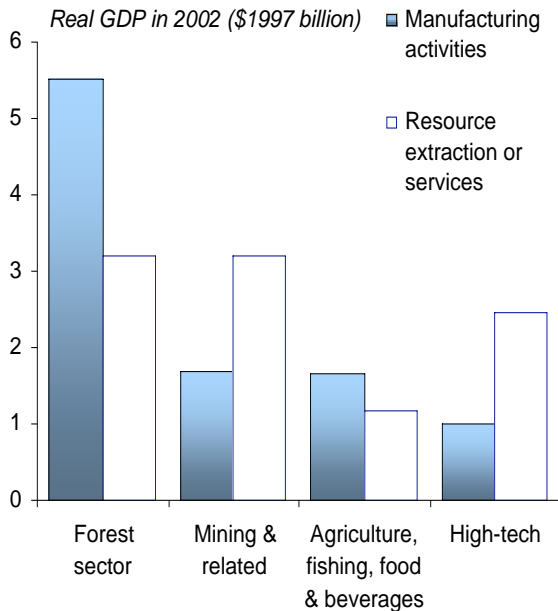
Manufacturing workers typically earn higher wages than workers in most other industries. Weekly wages in manufacturing industries (\$851) were about 23 % higher than the average for all industries (\$694) in 2004, and 30 per cent higher than the average for the service sector (\$656).

A Sector intertwined with other industries

While service industries are important to the economy, **manufacturing has the broadest “economic footprint.”**

Every day in British Columbia, residents and businesses are collaborating with the manufacturing sector to provide raw materials, intermediate goods and other business services.

Scientists, engineers, raw material suppliers, transportation companies, energy firms and others are integrally involved in providing inputs to create the manufactured products, while financial institutions, professional and technical services firms, along with business support services, help manufacturers to assemble, market, distribute and provide after sales care for their products.



Educators provide skilled personnel for manufacturers, while information, computer and telecommunications firms find their key customers amongst the manufacturing sector. In addition, large parts of the public sector provide services to manufacturing employees.

Manufacturers dominate forestry, agriculture, fisheries and food sectors, being responsible for more than 60% of their total GDP contributions. More than 30% of high technology's GDP originates in high technology products such as computers, pharmaceuticals and electronics.⁵

... Spread Throughout the Province.

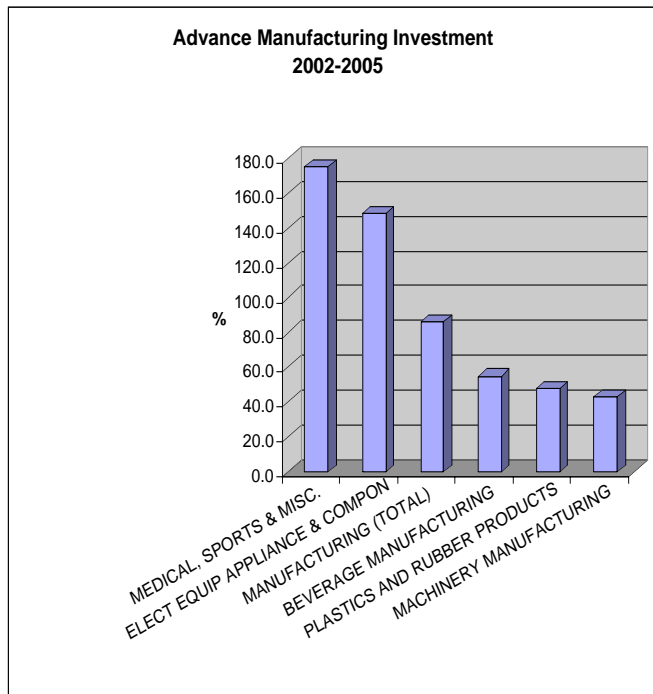
⁵ BC Stats – BC Opportunities Profile – Manufacturing, pg. 3

Manufacturing firms are distributed across the province and are the main source of jobs in many British Columbia Communities.

Manufacturing is a key employer in rural BC. The Thompson-Okanagan, Cariboo, Kootenay and North Coast/Nechako districts all have a higher proportion of manufacturing jobs than their share of total provincial employment.

The two most manufacturing-dependent regions are Cariboo with 17% of its jobs in that sector and North Coast/ Nechako with 15% of its jobs in manufacturing.

... That Powers Innovation.



Manufacturing has been a major contributor to innovation and growth in BC.

Investment is critical to future growth and manufacturers invest more in new technologies, machinery and equipment, and the construction of production facilities than any other business sector.

Manufacturers' capital investments are up 86% since 2002, with the wood sector up 269% and advanced manufacturing firms up 148% during the period.

The top five advanced manufacturing sectors have seen investment growth ranging from 43% to 178% in the past three years.

Persons Engaged in R&D in BC, 2002

Sector	Number Employed	R&D Investment (\$ Millions)
Ag/Food/Fish	135	17.3
Mining, Oil & Gas	65	16.0
Utilities	45	5.0
Construction	56	2.3
Manufacturing	2,996	412.4
Services	4,948	526.1
Total	8,245	979.1

R&D plays a power role in innovation, and manufacturing in BC is a major contributor. The most recent data shows BC's manufacturers employed almost 3000 people for research activities in BC and invested \$412 million in research and development. This is 90.7% of the goods-producing R&D employment in BC and 42.1% of all private sector R&D investment in the province.

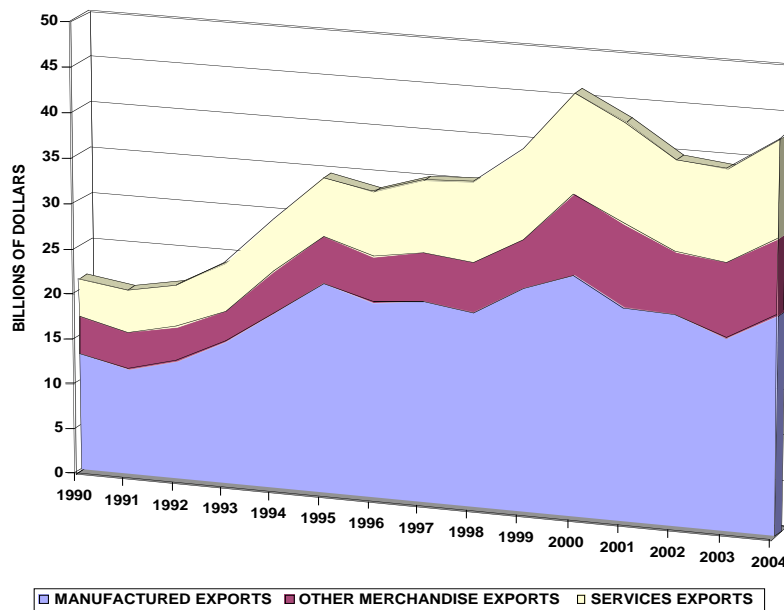
BC manufacturers were responsible for 5.7% of total Canadian R&D employment and 5.4% of total Canadian R&D investment.

Sources: Statistics Canada and BC Stats

A Global Business...

Today manufacturing is a global enterprise. Manufacturers are selling around the world, and sourcing raw materials, products, services, skills, knowledge and technologies on a global basis. As manufacturers expand their operations around the world, British Columbia has become an integral part of a complex network of competing global supply chains.

B.C. EXPORT PERFORMANCE



Provincial exports of manufactured goods have grown by over 90% since 1990 and totaled \$24 billion in 2004. Manufacturing accounts for 75% of BC's merchandise exports and 60% of total exports of goods and services.

BC's manufacturing sector is diversifying, as the proportion of advanced manufactured exports has risen from 25% in 1990 to 37% in 2004. Access to international markets – and particularly to markets in the United States – has provided manufacturers with the customer base they require to expand production and to specialize in higher value goods and services.

While BC has a more balanced trading relationship than Canada, with 69% of BC exports heading south versus 83% on average for the nation, the province is more dependent today on the United States markets than the 60% market share held when the Canada-U.S. Free Trade Agreement came into effect in 1989.

Top Ten Export Destinations

Destination	% of Total Exports
Washington	13.1
Japan	11.2
California	9.1
CHKT*	7.1
W. Europe	6.7
Oregon	4.7
Texas	3.1
Illinois	2.6
Wisconsin	2.3
S. Korea	2.2
U.S.A.	66.5

*China/Hong Kong/Taiwan

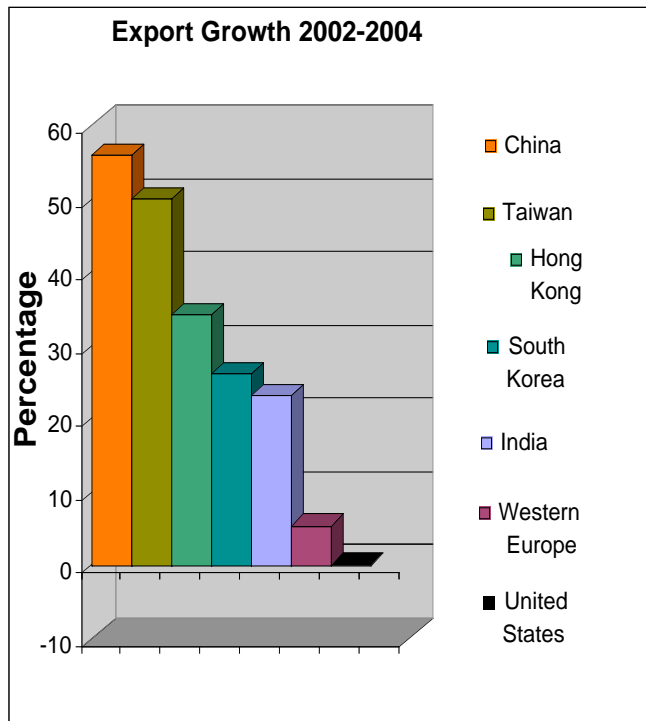
...With the US Markets Still the Major Export Destination...

Access to international markets – and particularly to markets in the United States – has provided BC manufacturers with the customer base they require to expand production and to specialize in higher value goods and services.

BC manufacturers continue to rely heavily on the North American market for their products with the US attracting 66.5% of all exports and 85% of BC's advanced manufacturing exports.

Source: BC Stats

Six US states are responsible for 35% of the province's total trade and 60% of its advanced manufacturing sales.



Japan attracted 11.2% of manufactured exports, while China/Hong Kong/Taiwan took 7.1%, followed by Western Europe with 6.9% and S. Korea with 2.3%

The fastest growing markets for BC manufactured products have been to Asia, but demand is mostly for primary products. Since 2002, exports to Mainland China increased 58.5%, while exports to Taiwan increased by 51% and to India by 41%. In contrast, exports to the U.S. and Europe fell 1.8% and 9% respectively.

Asian and European buyers prefer primary processed goods rather than value added products. Some 83% of manufactured goods shipped to Japan are primary manufactured commodities, while China (89%), South Korea (88%) and Italy (96%) have similar inclinations.

Part 2: Forces Shaping the Industry

The importance of British Columbia's manufacturing sector speaks for itself. The future and the lives of each and every British Columbian depend upon a prosperous manufacturing sector. Our standard of living depends on the wealth-generating capacity of manufacturers across the province – on their ability to innovate, continuously improve productivity, deliver customer value and compete around the world.

But manufacturers stand at a critical crossroads. On one hand, BC manufacturers are at the forefront of the knowledge revolution and the globalization of business activity – the key forces that are transforming economies around the world – and this will bring significant opportunities. Manufacturers, in fact, are poised to transform the province into a new “ideas based” economy.

On the other hand, manufacturers will face a series of challenges over the next ten to fifteen years as the business of manufacturing evolves. Some of the most important challenges identified during the Manufacturing 2020 consultations were: an “excellence gap”, a bottom line (profit) squeeze, changing patterns of customer demand, the emergence of China, India and other developing nations as industrial powerhouses, the intensification of competition in international markets, the appreciation of the Canadian dollar, shortages of skilled and experienced personnel, and managing the risks of new product and process innovations.

As BC manufacturers define their future in the global economy, they will also be defining the provincial economy itself. How these companies and governments respond to these challenges will fundamentally change the nature of manufacturing in the future.

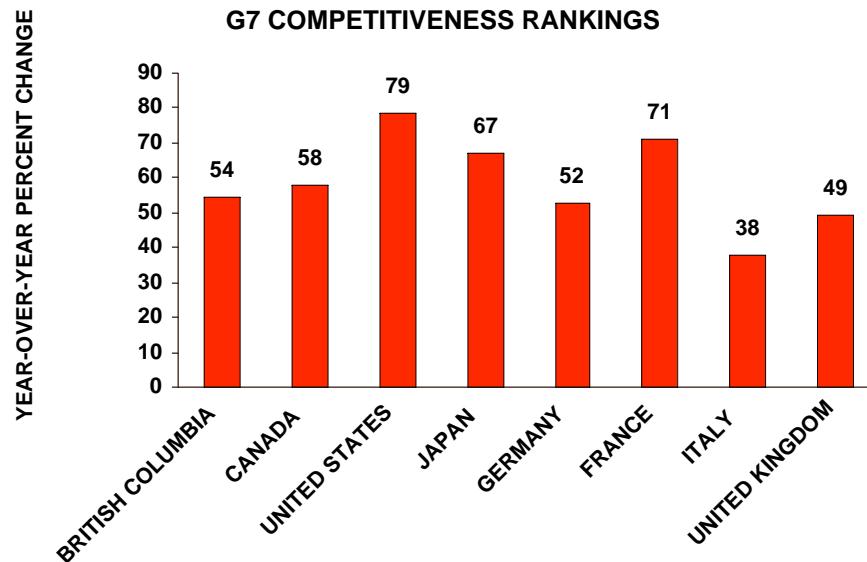
The Excellence Gap

The first challenge is the growing industrial performance gap in B.C. When benchmarked against industrial performance in other leading economies, a significant *excellence gap* has opened up between world-class practice and the average performance of BC industry. Using a series of indicators crucial to the competitive success of manufacturers worldwide, the performance of BC manufacturers was measured against the best of the world's seven leading economies or G7.⁶ BC manufacturing performance was measured in relation to six benchmarks of competitive success⁷ and the overall score is based on the average of the performance of BC against the best-in-class in each category. The excellence gap is the difference between BC's rating in each indicator and a perfect score of 100%.

The results show that BC manufacturers barely score a passing grade across all the competitive benchmarks, rating just 54% of the best of the G7. While BC stands well ahead of Italy (38%), and just ahead of German (52%) and UK industry (49%), it lags Canada (58%), Japan (67%), France (71%) and the United States (79%). Unfortunately, BC's principal competitors, the US and Japan score significantly higher than this province's manufacturers.

⁶ The Group of Seven (G7) industrial economies include Canada, the United States, Japan, Germany, France, Italy, and the United Kingdom.

⁷ This report uses six benchmarks namely: growth in manufacturing production, growth in the value of manufactured exports, the rate of improvement in labour productivity, changes in unit labour costs, business investment in new technology as a percent of GDP; and business investment in research and development as a percent of GDP. Three other benchmarks were not used due to data constraints, namely: after-tax profit margins as a percent of GDP, business investment in skills training as a percent of payroll costs and the rate of new commercialization, measured in terms of the growth in patents filed in the U.S. Trademark and Patent Office.



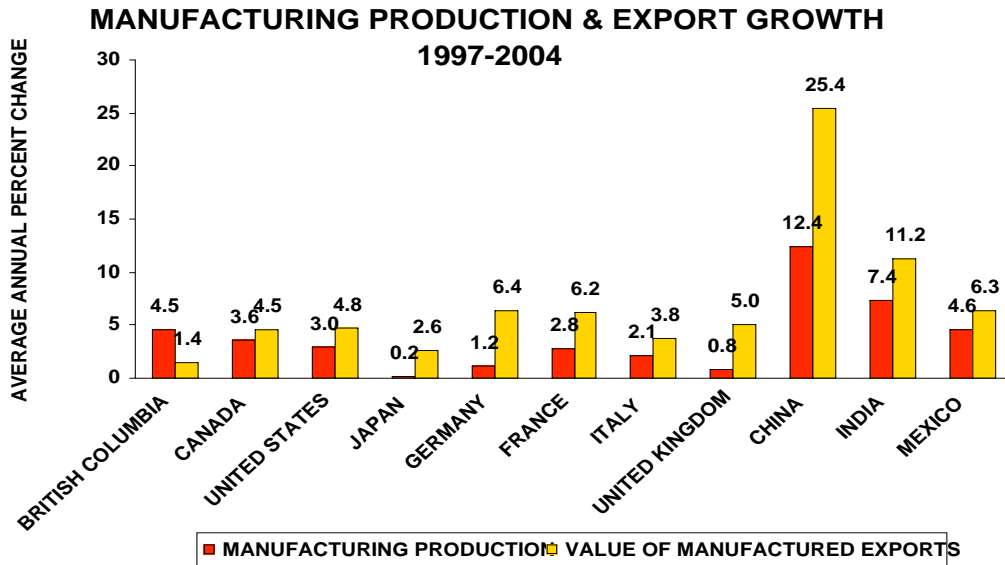
An even more interesting story emerges when the benchmarking data is broken down by component and BC manufacturers are compared against the best-in-class on each category. B.C. ranges from best-in-class in manufacturing production to barely passing grades for unit labour costs (59%) and failing marks for productivity (44%), investment in new technology (43%), investment in R&D (33%) and rates of export growth (22%).

**Benchmarking BC's Performance
1997-2004**

Indicator	G7 Leader	Benchmark	Canada	British Columbia
Production	Canada	3.6%	100%	125%
Exports	Germany	6.4%	70%	22%
Productivity (output per hour)	United States	8.0%	38%	44%
Unit Labour Costs	Japan	-2.4%	41%*	59%*
Investment in New Technology	Japan	16.1%	43%	43%
Investment in R&D	Japan	2.1%	55%	33%
Average	G7	100%	58%	54%

* Percent calculated across range of G7 performance.

Source: OECD Annual Statistics, various

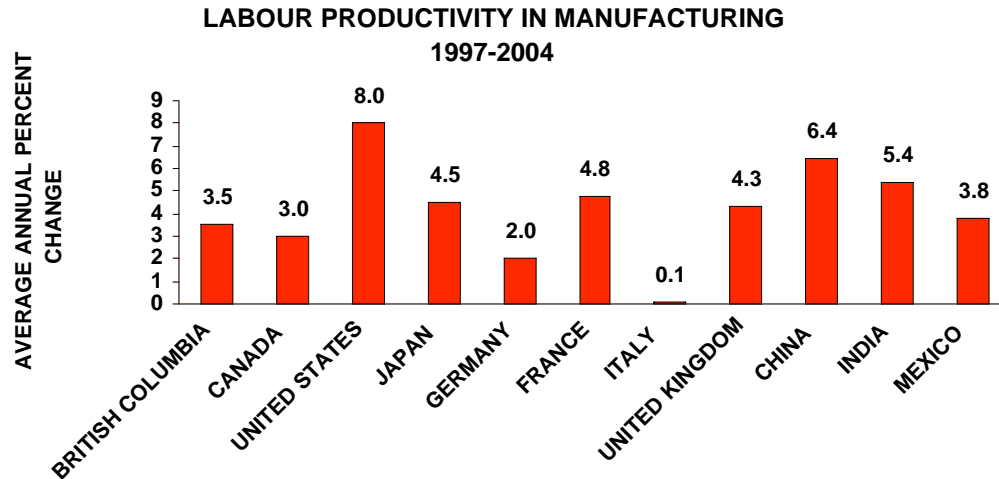


Moreover, export performance was precisely opposite B.C.'s record on production growth. BC's performance was just 22% of the best-in-class for export growth. The value of manufactured exports in B.C. rose at an average annual rate of just 1.4% over the seven years. This was lower than every one of the G7 competitors and was significantly behind the average annual growth rates recorded by emerging nations like China (25.4%), India (11.2%) and Mexico (6.3%) over the same period. Slow growth in exports sales limits available income for the economy, slows the rate of growth and hinders efforts to increase prosperity.

B.C.'s manufacturers face lagging productivity performance. Competitiveness, not to mention business survival, depends on driving down costs, making improvements in operating efficiencies, and a continued focus on delivering higher value products and services to customers. The more efficient the process, the higher the level of labour skills and expertise, the more ingenious the ideas, and the more innovative and customized the product or service, the greater the value of what is being produced and the higher the level of productivity will be. Higher productivity leads to higher employment, higher incomes, and higher rates of economic growth.

BC manufacturers can be pleased that their sector had average rates of productivity⁸ improvement above that of Canada (3.5% versus 3.0%) in the past seven years, but as noted below, their productivity performance has not been as strong as competing developed countries or newly industrialized nations. The implications of B.C.'s lacklustre productivity performance can be seen, both in terms of trailing income levels and higher production costs.

⁸ Productivity is a measure of the wealth creating capacity of any company, industry sector, or national economy. It basically tells us the value of output being generated per unit of input in terms of labour and capital, or technology.



The chart above shows BC's manufacturers are not keeping up with their American neighbours and principal competitors. BC's advanced manufacturers send 85% of their products into the U.S., so our poor performance today poses a real challenge not only in defending market share and responding to the impact of a higher Canadian dollar, but also in continuing to meet customer expectations for high value, low cost products and services.

While overall performance is flagging, some advanced manufacturing sectors in BC have productivity levels on par with or higher than those south of the border – wood products, automotive products and other transportation equipment, chemicals, primary metals, non-metallic minerals (like concrete, stone, and glass products), printing, and paper.

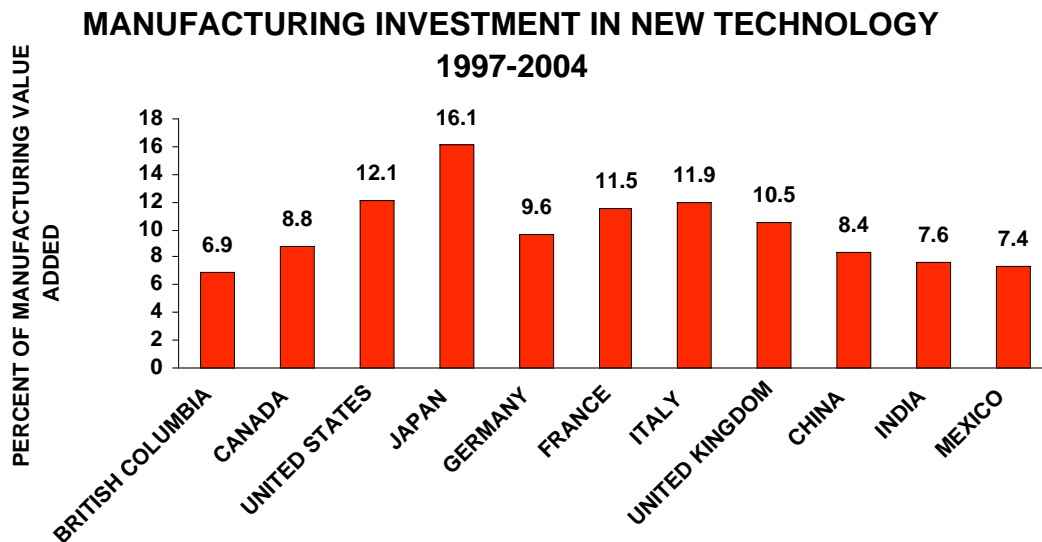
Competitors' unit labour costs are declining more quickly. Hourly wage rates (excluding overtime) in BC's manufacturing sector fell between 1997 and 2004 at an average rate of 0.1% per year, while they increased a modest 2.2% across Canada as a whole. This meant BC had the lowest rate of income growth for manufacturing employees in any of the G7 economies and substantially less than the average annual increase of 16.5% recorded in Mexico. Statistics are not available for China or India.

These lower wage rate increases, along with the lower Canadian dollar, helped BC's manufacturing sector reduce its unit labour costs by an average annual rate of 0.5% between 1997 and 2004. In fact, BC fared better than Canada, whose unit costs rose by 0.3%. However, B.C.'s competitors have been increasing their productivity growth much faster in recent years - simultaneously reducing unit labour costs, while allowing wages to rise. In fact, unit labour costs in the U.S. and France dropped by 0.7% per year and in Japan they dropped by 2.4% per year.

B.C. invests less in technology & innovation. Investments in new technologies give manufacturers the ability to keep up with customer demands, keep ahead of the competition, and drive cost savings and quality improvements throughout their operations. Yet, generally speaking, British Columbia manufacturers have not been keeping up with their competitors when it comes to making the investments in new technologies they need to improve productivity growth.

On average, BC manufacturers invested 6.9% of their GDP (value added) in new technologies, machinery, and equipment between 1997 and 2004. This compares to 8.8% for Canada's entire manufacturing sector and is the lowest amongst all the competitors, including emerging nations like Mexico and India. Japanese manufacturers lead the group, investing 16.1% of GDP in new

technology, while BC's main competitors, US manufacturers, rank second with an investment rate of 12.1% of GDP.



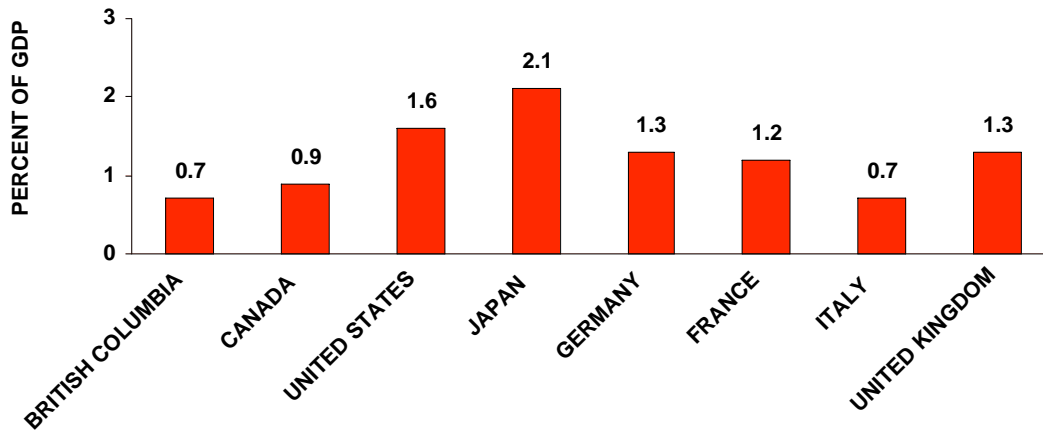
A lower Canadian dollar masked the problem until 2004 because it made it relatively cheaper to hire people than to invest in new technologies. Now conditions are reversed and the Canadian dollar is much higher. To survive, B.C. manufacturers will have to improve their productivity performance and make significant investments in new technology.

BC manufacturers invest relatively less in research and development than their counterparts in developed economies.⁹ As shown below, between 1997 and 2004, BC business invested an average of 0.7% of their GDP in R&D, again dropping to the bottom amongst the G7 competitors, tied with Italy. Canadian businesses invested 0.9% of their value added in R&D activities, while the United States invested three times B.C.'s rate and Japan invested three times the rate.

BC firms have also been slower than their competitors to invest in new information and communications systems as well as in the advanced manufacturing and integrated automation systems that have been credited in boosting manufacturing productivity in the top nations. Since 1990, the rate of growth in the value of technology-in-place has fallen behind that of American manufacturers.

⁹ The data on investment in technology is only available for BC only and is not broken down by sector, but the conclusions remain valid because BC's manufacturing sector is the main investor in technology in the province.

BUSINESS INVESTMENT IN RESEARCH & DEVELOPMENT 1997-2004



BC firms are also not paying enough attention to increasing the efficiency of their operations through continuous improvement and process innovations to accelerate the productivity benefits from their investments in new technologies. Whereas American manufacturers have been able to generate long-term growth in labour productivity per dollar invested in technology, our companies have been losing ground since the mid-1990s. BC firms will need to substantially increase their efforts to drive peak efficiency through production systems or their productivity performance will continue to fall behind, regardless of how much they invest in new technologies.

Bottom Line Pressures

Internal challenges by B.C. manufacturers have partially contributed to B.C.'s excellence gap, but there have also been other external factors that have contributed to these challenges. One of the biggest has been bottom line pressures. Profit margins drive manufacturers today. And, for good reason – a healthy bottom line not only keeps shareholders, banks, and other investors happy; it is essential for generating the cash that drives investments in innovation, new production capacity, and new technologies.

In recent years rising costs and falling prices are creating a real squeeze on the bottom line for BC companies. **The cost of raw materials has soared** as a result of booming industrial demand in China and stronger economic growth around the world. The weakness of the U.S. dollar has exerted additional upward pressures on the price of primary commodities. The cost of iron ore, nickel, copper, aluminium, and other metals has increased dramatically since 2001. The price of scrap metal, an important ingredient in some steel making processes, more than tripled in 2003 alone. Similar cost pressures are being felt by manufacturers reliant on coal and other non-metallic minerals, or on natural gas, resins, and other chemical feed-stocks.

Industrial energy costs have more than doubled in Canada since 2000. Oil and natural gas prices have both soared as a result of both rising demand for energy and supply constraints. While wage rates have been relatively stable in BC, payroll taxes and supplementary labour benefits are growing even more rapidly on an hourly rated basis. Other operating taxes, user fees, and regulatory compliance costs are also on the rise. Regulations with respect to how products are

made and what they contain, how they are approved and how they are sold, require manufacturers to incur costs in their operations and information systems in order to comply with the rules. There are also hidden costs in the form of time delays, uncertainties, and lost business opportunities that result from complex regulations and inefficient government. These are all forms of mandatory overhead that individual companies have to bear.

While costs are up significantly, prices are not. The average selling price for B.C. manufacturers increased by only 3.5% in total over the period January, 2001 to June, 2005.

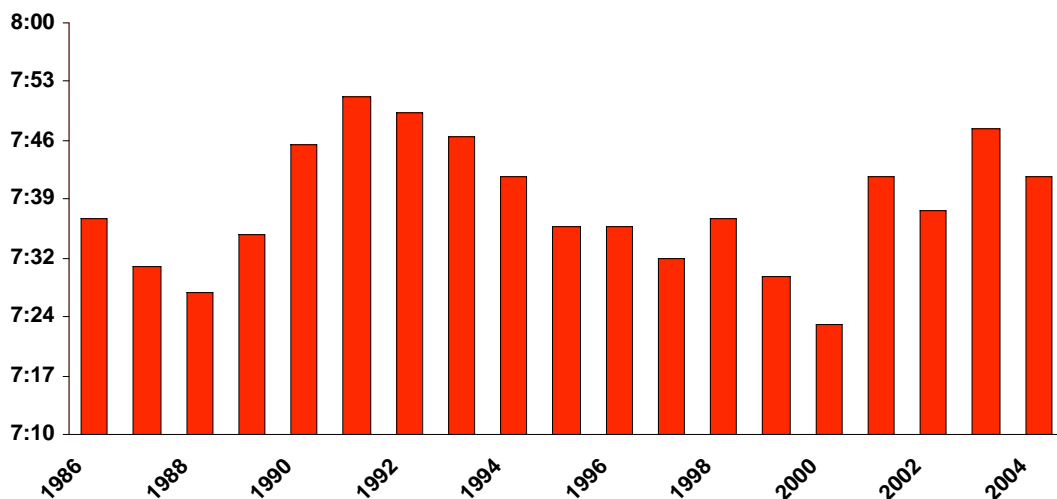
GLOBAL COMPETITION, GLOBAL PRESSURES COST SQUEEZE:

Selling Prices	-2.5%
Wage Rates	+17.5%
Raw Materials	+45.4%
Payroll Taxes & Benefits	+26.4%
Electricity	+54.2%
Industrial Fuels	+138.5%

As a result, profits suffer. In 2004, it took B.C. manufacturers an average of 7 hours and 42 minutes out of every 8-hour production shift to break even – to cover their operating costs, financing costs, and capital depreciation. It took them an estimated 6 minutes to pay corporate income tax – leaving only 12 minutes per shift to make the money required to invest in market development, product innovations, process improvements, organizational changes, workforce training, and new technologies necessary for sustaining competitive success. This is nineteen minutes less than was available in 2000.

With profit margins under pressure, BC manufacturers have less money to invest in either the research and development activities required for new product and process innovations or in new, more productive technologies. Their investment record lags significantly behind manufacturers in the rest of Canada, across the G7 economies as a whole, and in newly industrialized countries like China, India, and Mexico.

CANADA: MANUFACTURERS' BREAKEVEN TIME



Rising Canadian Dollar

The appreciation of the Canadian dollar has hurt BC firms significantly because international markets account for more than 55% of their total operating revenue and most exporters price their exports in U.S. dollars. The appreciation of the Canadian dollar has been like a 15% price cut on export sales since 2003 and this has created significant challenges for BC firms, whose costs in every area are rising. Slowing export growth is an immediate result.

For most manufacturers, the appreciation of the Canadian dollar has had a significant negative impact on profit margins, cash flow, and competitiveness. It is forcing companies to restructure their internal operations, their supply chains, their marketing strategies, and their pricing policies in order to retain customers, cut costs, and boost productivity performance.

There are, however, some benefits from a higher Canadian dollar. It reduces the cost of imported goods, technologies, and capital equipment. It lowers labour costs if paid in U.S. dollars. And, it makes it easier for B.C. firms to invest in new products, intellectual property rights, and skilled workers around the world.

Global Competition

Global competition will be a serious challenge for BC manufacturers. The emergence of China as a major economic power will be the most significant factor determining the long-term future of manufacturing in this country and will change the nature of economic activity in Canada, across all of North America, and around the world. It is already forcing businesses to reassess what part of their activities – what type of jobs – are likely to remain in Canada in the future.

With average labour costs about 1/40th of those in Canada, China is now a leading manufacturer of textiles, consumer products and increasingly sophisticated electronic equipment, software, and other technologies. China's excess industrial capacity and cost advantage have dramatically lowered the price of manufactured goods being sold around the world. As well, China is increasingly competing on the basis of high-end value-added products, using some of the world's best technologies and drawing from a pool of highly skilled talent. Faced with the rapid expansion of low-cost production capacity in China, manufacturers around the world are experiencing competitive pressures as never before.

At the same time, China is a source of dynamic market growth and for manufacturers a means of cutting production costs, improving supply chain efficiencies, buoying up profits, and lowering prices for customers. For many companies, there are significant opportunities to be gained by outsourcing to China and, in some instances, locating production there to serve not only the Chinese market but as part of a larger global supply chain.

China is also a large and rapidly growing market for raw materials, industrial goods, capital equipment, and consumer products. Escalating demand for raw materials in China is driving up the price of commodities from lumber and coal to scrap metal and chemical feed-stocks.

However, China is not the only source of low cost and increasingly high value competition that Canadian manufacturers are facing. Throughout the past decade, there has been the emergence and development of large export-oriented industry sectors in Southeast Asia and South Korea, Mexico, and South America. Now India is a major competitor, particularly in the fields of software and business services. Eastern Europe has become a magnet for manufacturers poised to take advantage of the expansion of the European Union.

For manufacturers, international competition is a reality at home as well as in export markets. Contracts today are won or lost on a click of a mouse. And manufacturers around the world have developed the capacity to supply high-value, sophisticated products to customers at lower and lower prices.

B.C. manufacturers are facing intense competition in their efforts to defend and grow market share. They are competing for supply contracts from customers who are now able to source products and services on a global basis. Manufacturers are competing for the best in knowledge, skills, and technologies from around the world. And, the province's manufacturers are competing for investments and product mandates on the part of manufacturers and other businesses that can choose from a variety of attractive investment locations with lower costs and more reliable infrastructure.

To compete, manufacturers are rationalizing their supply chains, moving away from traditional purchasing policies, and adopting a global sourcing strategy. Smaller manufacturers in particular are facing tough challenges as their customers focus on the lowest price and speediest delivery available to them from suppliers around the world.

New market opportunities are opening up. NAFTA broadened the North American market for Canadian manufacturers and exporters in the last twenty years. Today over 55% of what is manufactured in Canada is exported to other countries. Almost 70% of B.C.'s manufacturing output is sold into or through the United States. A large part of those exports to the U.S. are then distributed outside of North America.

New and highly lucrative market opportunities are opening up around the world – in Europe, Africa, the Middle East, Latin America, India, Southeast Asia, and China. All are on the radar screens of Canadian companies as they look at expanding their sales, investments, and sourcing activities outside North America and the 2010 Olympic Games are raising awareness amongst these markets as to the opportunities that do exist.

More Demanding Customers and Stakeholders

Today the customer rules. For manufacturers, both business success and profit margins are driven by meeting customer needs. The challenge is that customer requirements are also rapidly changing – at a time when the competition is greater than ever before.

Whether they are individual consumers, other manufacturers, or other businesses, customers are demanding new products to meet new needs and better products to fulfill old ones. They expect quality to be high, products to be delivered on time, and prices to be the lowest on the market. That is the baseline. They are also demanding more in the way of value and service, and customer loyalty is disappearing almost everywhere. Consumers are expecting better functionality, customized design, financing, and after-sales service. So too are business customers. Suppliers are no longer being asked simply to manufacture to specifications, but to solve the technical and business problems of their clients – to provide design and engineering, financing, quality assurance, technical assistance, and ongoing services – all at a reduced price.

Consumer tastes and purchasing power are also changing. Product innovation and new technologies create new demands. An aging population and changing immigration trends are leading to different consumer purchasing patterns - opening new markets and closing old. So too are changes in the pattern of work and leisure activity.

Manufacturers and other businesses also must meet a host of requirements set by other stakeholders in addition to their customers. They must deliver returns to their investors and value to shareholders. They have responsibilities to their employees and the communities in which they

operate. And, they are having to respond to more and more stringent requirements set by governments and other regulating agencies – rules that cover the way companies are run, the nature of their goods and services and the way that they are produced, the health, safety, and security of employees and the public at large, as well as business impacts on the environment.

Accelerating Pace of Technological Change

Product and process innovations are essential if manufacturers are to keep up with new and changing customer requirements. They are even more important when it comes to keeping up with the competition.

The development and commercial application of new technologies has led to a revolution in both product and production capabilities. And, the **pace of change will continue to accelerate** as a result of new and transformational applications of information and communication technologies, biotechnology, micro- and nano-technologies, new materials, energy technologies, sensors, robotics, and other advanced machining, measuring, and automation systems. New process and shop-floor innovations help to improve operating efficiencies, and boost quality and customer service.

But accelerated innovation also brings tremendous challenges. It is shortening product life cycles and creating new and more demanding expectations on the part of customers. Some manufacturers are facing a market window of only a few months before the competition steps in or customer requirements change. The electronics sector is a good example. There are also considerable challenges in managing the risks of change, mobilizing resources behind innovation, and creating a working environment that rewards risk-taking and creativity.

Today manufacturers have to continuously upgrade their products, processes, and technologies simply to maintain their position in the market. They have to make even greater investments in innovation in order to grow.

The accelerating pace of technological change combined with more intense competition and excess industrial capacity in world markets has led to the commoditization of manufacturing around the world. Simply put, as demanding as customers are, there are more and more goods and services being produced that can effectively meet their needs. The result is falling prices for most manufactured goods.

Downward pricing pressures are intense. Few companies are in a position to pass their input price increases along to their customers. Just the opposite. Business customers are forcing price cuts down the line to their suppliers. Contracts are now in place that will require some companies to cut prices by 20% or more over a period of only three years.

Skills Shortages

Skills shortages are one of the most protracted problems that B.C. manufacturers face, but the future looks even more daunting. A wave of retirements will hit our manufacturing sector over the next ten years. Companies will lose many highly skilled employees with years of experience and wisdom built up in the industry. At current rates of labour force growth, by 2010 there will be more people retiring than entering the manufacturing workforce.

Manufacturers are already reporting shortages of personnel with specialized skills and expertise and there will be increasing difficulties finding employees with the right skills sets to meet the rapidly changing, yet demanding jobs of the next generation.

Infrastructure Pressure

B.C. manufacturers have always placed a heavy emphasis on well-developed infrastructure. Up until the mid-1990s, manufacturers viewed the quality of the province's transportation, communication, and utilities infrastructure as a significant competitive advantage for their business, but conditions have changed. Infrastructure constraints are becoming a major deterrent for firms endeavouring to manage their ever expanding global supply chains and to meet the growing requirements for just in time delivery across the street and around the world. Time is the currency of the 21st century, so infrastructure impediments can severely undermine the ability of B.C. firms to make sales and to compete globally.

Market Access Challenges

B.C. manufacturers count on a seamless border with the United States and access into international markets to provide them with the potential to grow their businesses.

Delays and security measures that have been implemented along the American border pose hurdles for Canadian companies that depend on the timely delivery of exports and imports and the free movement of personnel between Canada and the United States to carry out their business or invest in Canada.

In the United States, trade actions and import restrictions are affecting exports of softwood lumber and beef products. New protectionist actions against China or other emerging economies that are being contemplated in the U.S. could also sideswipe B.C. exporters. Meanwhile, entry into American state and local markets for government procurement and professional services remains as impenetrable as ever.

International trade agreements have expanded access around the world – multilaterally through the World Trade Organization, but particularly within North America and Chile where free trade agreements have been negotiated and are now in place. Nevertheless, B.C. manufacturers and exporters are facing challenges in the form of growing protectionist sentiment and barriers to trade and investment activity on the part of many of our major trading partners. There is widespread concern that the international playing field for trade and investment remains uneven – to the marked disadvantage of B.C. and Canadian business.

The Cost of Regulation

Manufacturers are facing a more highly regulated business environment across the country. In many cases, best practice among the business community itself is setting more stringent standards for how companies should act with respect to health and safety, environmental management, consumer protection, and corporate governance. But, other regulating bodies – both public and private, around the world – are also developing rules and standards that for manufacturers make it more complicated, more costly, and more difficult to comply.

Regional and SME Constraints

Significant elements of B.C.'s manufacturing industry exist in smaller communities across the province and manufacturers in these areas face additional challenges because of a lack of critical mass. In rural communities there are few or no local suppliers, customers, or colleagues facing similar circumstances with whom to share best practice. Firms lack access to a full range of business and financial services, and there is often a lack of local skills training facilities. Once young people leave communities, they rarely return, especially if jobs are unavailable in the fields in which they are qualified. Transportation costs are higher and fewer health care and education services make it more difficult to attract and retain highly qualified personnel,

Small and medium enterprises also face greater difficulties. It takes considerable money, manpower, time, and effort to respond to the challenges as well as the opportunities that are facing manufacturers today – resources that many smaller companies simply do not have. The ability of smaller companies to respond to the challenges they face is therefore crucial, not only to their own growth prospects, but to the strength of the economy as a whole.

Managing Change

Manufacturers are confronting a whirlwind of change. The challenges they face are complex. For some companies, they are overwhelming. They are all expensive to overcome.

Yet, the business of manufacturing has always been one of coping with change. The 1990s saw manufacturing restructure across Canada and grow in the wake of North American free trade. The result was a different way of doing business – more specialized types of production, a growing export orientation, head office consolidation, and a more integrated industrial market with the United States.

Markets are again changing – fast. B.C. companies are now responding to a stronger dollar, the rise of new global competitors like China and India, the emergence of new international market opportunities, the need to catch up in the race for innovation and productivity improvement, and a domestic business environment that has become a less reliable competitive advantage for manufacturers.

Part 3: The Need to be World Class

A Revolution is Underway

There is a revolution occurring in the business of manufacturing around the world and BC's manufacturing community is being impacted by this global business tsunami. In 2020, the business of manufacturing will look very different in B.C. than it does today, but there is a significant cadre of manufacturing leaders in this province who are already operating at this new level and more who will follow.

How manufacturers respond to the challenges and the opportunities they face in their operating environment, as well as to the global trends reshaping their business throughout the world, will fundamentally change the nature of manufacturing in this province over the next ten to fifteen years. B.C. manufacturers will have little choice but to be world-class in a new era of global competition, global supply chains, and new global market opportunities. Innovation will be key in driving higher value and productivity improvements. International trade and business partnerships will be an integral part of business development. New investments will be needed to keep pace with technological change. New skills will be required in a more knowledge-intensive workplace. And, time, agility, and customer service will be important differentiators of competitive success.

While Appendix-1 provides a more detailed summary of the expected trends in the manufacturing sector across all sectors, B.C. manufacturers foresee a future for their industry in this province that will be characterized by:

Greater Product Specialization

Standard products that can be mass-produced and shipped long distances will be manufactured in newly industrialized countries, who have much lower production and delivery costs and whose manufacturers are able to offer improved standards of quality, technical sophistication, and product and vendor reliability.

Successful BC firms will drive profits through increased specialization, service, customized design and functionality, and expansion of niche products and markets where they command a higher premium from their customers because they offer improved standards of quality, technical sophistication, and product and vendor reliability. Successful BC firms will thrive by selling products that require a higher degree of innovation and customization, involve smaller production runs, and use flexible production systems. Or, they will develop products specially designed for local customers, or need to be manufactured in close proximity to the customers.

Operating Higher Up the Value Chain

Product specialization will drive British Columbia manufacturers further up the value chain in terms of the nature of their enterprises. More and more value will be created at the customer end of the production chain than in the basic fabrication and processing phase of product cycles. In short, value will be created more at the front end rather than in the final phase of product cycles.

There will be an acceleration in the trend of BC manufacturers moving up from being Tier 4 suppliers of standard materials, products, and parts or the traditional "product fabricator" to Tier 3 companies involved in building specialized sub-assembly or integrated batch processing. More

companies will move beyond Tier 3 to become Tier 2 suppliers that are engaged in integrating materials, sub-assemblies, and components and more will need to follow. And, more and more manufacturing firms will become Tier 1 companies – or the original equipment manufacturers (OEMs) – whose business is in developing new products or customer solutions and bringing them to market. In fact, numerous new BC businesses will jump directly to Tier 1 operations and many will operate as virtual businesses.

MANUFACTURERS MUST MOVE UP THE VALUE CHAIN

Tier	Production System	Core Business	Market Scope	Supply Chain	Intellectual Property
1 (OEM)	Final Integration/ Testing	Technology/ Product Concept Product Development (Proof of Concept) Brand/Service	Global	Global	Product Technology
2	Integration/ Assembly/ Fabrication	Prototype Development Design Validation	Global Regional	Global Regional	Technology Process
3	Sub-Assembly/ Integrated Processing/ Fabrication	Process Validation Pre-Production Planning	Regional Local	Regional Local	Process
4	Fabrication Processing	Production Materials Handling	Local	Local	None

As production evolves from fabrication to assembly and integration, the primary functions of the enterprise will shift from a focus on materials management and production processes, to process validation and pre-production planning, to prototype development and design validation, and finally at the stage of the OEM to technology genesis, product development, and testing. BC companies will need support

Over the next decade, every effort will need to be made to ensure BC manufacturers are maximizing the value from their production, and BC manufacturers will require a commitment to perfection with respect to product quality, production processes, and business systems.

Innovation, Design, Branding and Customer Service as Core Business

The pace of technological change and the intensity of global competition will mean that BC manufacturers will need to derive their revenue through innovation, design, branding and customer service.

BC firms will thrive in the future only if they are able to innovate, to automate and to integrate through the use of advanced information and communication technology. The management of innovation will be a core competency across the province's manufacturing sector. Continuous product development processes, reconfigurable production technologies, and rapid access to

new technologies will be fundamental to both product differentiation and agile business strategies.

The challenge will be to find ways for BC firms to generate high performance results by aligning their business plans and manufacturing strategies to anticipating and meeting the needs of customers. BC manufacturers will need to create a culture of innovation extending to all parts of the business, from the development and commercialization of new and improved products and services, to the adoption of new technologies, production and business processes, to the development of new market opportunities and the execution of new business plans.

World Leadership in Lean Business Systems

The business of manufacturing will be focused on anticipating and meeting customer requirements – and it will require operating processes within companies and across supply chains that are aligned and extremely efficient in delivering customer value. B.C. manufacturers will have become adept at eliminating waste – activities that do not contribute to providing value to customers – throughout their own manufacturing operations, on an enterprise-wide level and across supply chains and business networks. The rapid adoption of the business practices of lean enterprises will be critical to the success of BC firms in creating a mass customization economy in the province.

Global Businesses

More and more manufacturers in BC will operate global enterprises and our economy's success will depend on well they operate on a global scale. As such, the scope of their international business activities will extend far beyond trade.

Companies will not just import goods for further processing or distribution in B.C. and produce goods in this province for export. They will operate their businesses on a global scale, investing to secure assets around the world, expanding their operations into other countries, sourcing skills and technologies on a worldwide basis, allocating resources and consolidating their activities according to global business plans. Global marketing – taking advantage of business opportunities in markets around the world - will be come an essential success factor.

Manufacturers in B.C. will be part of a global system of competing supply chains and business networks aligned to meet the needs of consumers in markets around the world. BC manufacturers will become adept at global supply chain management. Global sourcing – the ability to access the best products, technologies, skills, and expertise from around the world – will be a core requirement. BC firms will be agile in terms of modifying products, processes, operations, and customer service in light of constantly changing customer preferences and the much shorter product development cycle – where the time from concept through prototype development, testing, and production and service scale-up is may be a matter of weeks or months rather than years.

Integration of all business functions will be critical to the success of BC manufacturers. Management and administration functions, purchasing and materials management, design, engineering, production, inventory control, financing, and customer relations must be integrated through electronic information and communication systems. And these functions will need to be integrated within manufacturing companies and across supply chains and business networks – with customers, suppliers, and other business partners.

Fostering the BC Advantage

As world markets and economic power begins shifting back to the Pacific Rim, the province will have significant global advantage in its location. Manufacturers will need to take advantage of this preferred location in which to do business, making the rapid shift to mass customization even more critical.

In the past, B.C.'s location has hampered the ability of firms to compete in world markets. NAFTA challenged BC manufacturers to supply customers from the fringes of the North American market economy and often under adverse public policy conditions. BC manufacturers who have thrived in this environment have done so by being more agile and nimble, more market focused and niche oriented, more actively engaged in innovation and more customer sensitive. Many traditional industry operations, such as those in the dimension lumber business, have been revolutionized by these challenges in ways never imaged. Many BC firms have become leaders in outsourcing to remain competitive and many firms are experts in global supply chain management to remain effective and others have begun to open new markets and design new products.

More and more BC firms will need to follow in these footsteps, spurred on by the success of these existing operations. As BC eliminates the vestiges of "traditional" manufacturing in British Columbia, the province will be well positioned to evolve to mass customization and to become truly global players.

The New Paradigm

These global trends are causing manufacturers across Canada to restructure their businesses. They are not alone. There is a revolution occurring in the business of manufacturing around the world. Business strategies are changing. Now, companies are operating with flexible and highly automated production systems, producing customized goods and services, and are both part of and dependent on supply chains with global reach.

There is a new paradigm and it is changing the face of manufacturing across the country and around the world. As it becomes more prominent, the new system will change the face of manufacturing forever. The following table compares the attributes of the two systems, while Appendix 1 provides some details on the way the new paradigm is evolving.

How the New Paradigm Works

Traditional Manufacturing	New Paradigm
Customers & Markets	Customers & Markets
Domestic/North American market	Global markets
Customers sourcing locally	Customers sourcing globally
Production push	Customer pull
Mass markets	Niche markets/individual customers
Competing for market share	Competing for markets, investments, product mandates
Higher costs are passed to customers in higher prices	Higher costs have to be absorbed – prices are falling
Prices determined by local competition	Prices set by disruptive global competition
Products	Products
Value based on products	Value based on service
Competitiveness based on cost, quality, time to market	Time is now the premium, but customization, service – price competitiveness is more important than ever
Operations	Operations
Efficiency drives competitiveness	Innovation drives competitiveness
Local purchasing & materials handling	Managing a global supply chain
Mass production	Mass Customization
Growth through higher volumes	Growth through innovation
Static production processes	Flexible production systems
Stand alone discreet technologies	Integrated technologies
Mechanical processes	Automated processes
Long production runs	Short production runs
Cost cutting	Waste elimination
Sequential product development	Complex systems
Pollution control	Environmental sustainability
Well established marketing channels	Myriad new marketing channels and extensive use of the internet
Organizations	Organizations
Corporate organizations	Business networks
Companies compete	Supply chains compete
Internal performance standards	World-class benchmarks
Manual skills	Knowledge based skills
Work under specifications	Problem solving
Functional materials, products, processes	Smart materials, products, processes
Production management	Life cycle management
Reactive governance	Proactive governance

Getting to the Future

In the global economy of 2020, money, knowledge, and people will be highly mobile. What will anchor the high value-adding activities that are part of the business of manufacturing here in British Columbia? What needs to be done to ensure that BC manufacturers continue to lead the BC economy into the foreseeable future?

Our existing assets – our resources, our skilled workforce, and our proximity to the United States, our political, legal, and fiscal regimes – will help, but this province’s manufacturing success will depend on the ability of the industry to continue to restructure in response to the challenges and opportunities that lie ahead.

In looking forward over the next ten to fifteen years, British Columbia manufacturers indicate that their future competitiveness and growth opportunities will depend on the following factors they believe will be critical to sustaining the competitive success of British Columbia manufacturing, achieving the goal of enhanced prosperity for all our citizens and creating a sustainable economy.

However, success can not be achieved alone. Success will require a concerted effort by government, business, academia and labour over a sustained period of years.

In summary, the differentiators of future success will be:

Time – the “Currency of the 21st century” – will become an advantage for British Columbia manufacturers capable of rapid customer response, managing short product lead times and fast production changeovers, quick delivery schedules, and the rapid commercialization of new products and processes;

Customer solutions will generate high performance results as BC firms align their business plans and manufacturing strategies to anticipating and meeting the needs of customers. Manufacturers that provide solutions become integral to their customers' success;

Product differentiation through greater specialization, service, customized design and functionality, and the development of niche products and markets will be critical to success;

A culture of innovation extending to all parts of the business, from the development and commercialization of new and improved products and services, to the adoption of new technologies, production and business processes, to the development of new market opportunities and the execution of new business plans will be widespread;

Global sourcing - the ability to access the best products, technologies, skills, and expertise from around the world that meet business requirements will be the operating norm;

Global marketing – taking advantage of business opportunities in markets around the world will be benchmarked from BC.

Continuous improvement – a commitment to Lean business principles (eliminating wasteful activities that do not contribute to customer value), total quality products and processes, and zero defects will be fundamental;

Agility – strategic flexibility in terms of products, processes, operations, and customer service will be a key factor;

Integrity – a business culture and operating practices built on trust, reliability, accountability, community involvement, a healthy and safe workforce, and environmental stewardship will be a standard.

Close collaboration through cross-functional teams in the workplace, across value chains involving both suppliers and customers, and with other companies in sharing resources, expertise, and best practice; and,

Cost competitiveness with respect to the total cost of delivering products to customers will be at the core of BC business success.

The Workforce of the Future

In looking forward over the next ten to fifteen years, the B.C. workforce will be one of the most critical factors in the future competitiveness and growth opportunities for manufacturers. Simply put, business success depends on people. Manufacturers in British Columbia and across Canada will only be as competitive as the capabilities of their workforce allow. In 2020, our manufacturing workforce will have to be highly knowledgeable, highly skilled, highly experienced, and highly flexible. These same qualities are important right now.

Workforce capabilities will be an even more important determinant of competitive success in a manufacturing world in 2020 where knowledge and capital are the prime assets and business growth will be driven by the continuous acquisition, deployment, protection, and funding of new knowledge.

While the face of manufacturing is rapidly changing and predictions are an imperfect science, there is a general agreement amongst manufacturers that the growing complexity of tasks and the rapid pace of change with respect to technologies, organizations, and business objectives will mean that Canada's manufacturing workforce in 2020 will have substantially different core competencies from those of today. In 2020 manufacturers will continue to require both people with specialized skills and multi-skilled workers, whose skills will likely include:

- A mix of creative problem-solving capabilities, technical know-how, business skills, and an ability to interact with colleagues and customers;
- A higher degree of technical and technological expertise as production systems become more automated and more interconnected, and as workplaces incorporate advanced technologies such as nanotechnology, biotechnology, microelectronics, and robotics;
- Continued reliance on the skilled trades, but in combination with other technical and business skills;
- A greater reliance on manufacturing and product engineering, product and process design, and scientific research;
- Multilingual and multicultural skills, as business operations expand on a more global basis;
- Management skills in the fields of manufacturing processes, supply chains, product and knowledge development, financing, and global business; and,
- An ability to adapt easily to constantly-changing roles in a constantly-changing workplace and employees who are flexible enough to adapt to changes in their job and both willing and able to continuously upgrade their knowledge and skills on a path of life-long learning.

More responsibility for decision-making will be passed to workers at all levels of the manufacturing enterprise, requiring a more seamless alignment of responsibilities, competencies, and rewards throughout business organizations. This means that human resource management will have to become a core competency for the business of manufacturing and labour-management relations will need to become more collaborative.

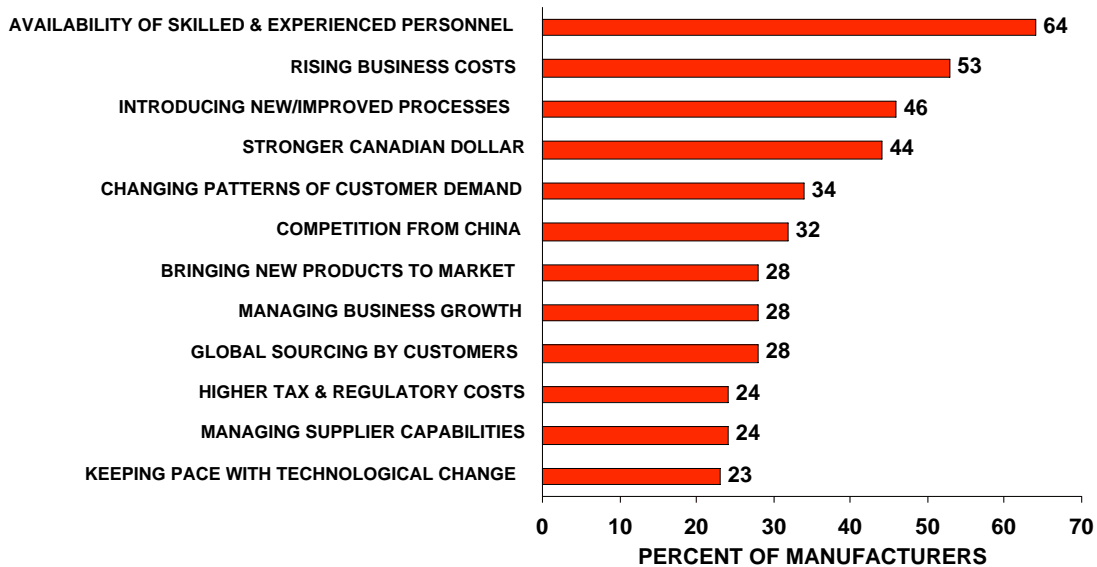
Part 4: Achieving Global Excellence

B.C. manufacturers are restructuring their businesses in response to the challenges they face in the global marketplace. However, they are not alone. The emergence of new markets and disruptive low-cost competition, the rapid development of new technological capabilities, more demanding customers, a more discerning public, and intense bottom-line pressures are changing the nature of manufacturing around the world.

The future for manufacturers will one of global customers, global supply chains and business networks, and the potential to source from the best companies, the best technologies, and the best skills from around the world. Growth will be driven by innovation and the ability to respond to rapidly changing customer needs. It will be built on sophisticated information and production technologies with powerful capabilities to revolutionize products, businesses, and production processes. It will require ever-greater degrees of precision and flexibility. And it will need new knowledge and highly skilled people to make it work.

“Our vision should be to become the most prosperous region in Canada by 2010 and in the Americas by 2020, based on the BC Progress Board’s benchmark indicators.”
Ben Hume, CEO - Alco Ventures

STRATEGIC CHALLENGES FOR BC MANUFACTURERS



In the 2004 Management Issues Survey, B.C. manufacturers outlined a variety of strategic challenges that they felt manufacturers would face. In order to take on those strategic challenges and persevere, manufacturers overwhelmingly identified seven critical success factors that would be needed to eliminate the “excellence gap” that exists, address the various challenges and make B.C. manufacturers the “best-in-class” when compared to the G7. These critical factors in order of priority were:

- **Leadership.** Business strategies, public policies and programs, must be coordinated and aligned to strengthen our economic growth potential in the global markets;
- **Innovation.** British Columbia manufacturers must be leaders in all aspects of innovation, including flexibility and continuous improvement;

- **Workforce capabilities.** The province's workforce must be ready and able to meet the future requirements of manufacturing;
- **A competitive business environment.** British Columbia must become the preferred location in North America for businesses to locate, invest, manufacture, export from, employ, and grow.
- **Infrastructure.** The province's transportation, telecommunications, and energy infrastructure must resume its role as a major driver of business investment and economic growth;
- **International business development.** B.C. businesses need the capacity to operate on a global scale; and
- **Business and financial services.** The changing financial and servicing requirements of manufacturing must be met in a cost effective way.

"We know that we have to climb into the crow's nest from time to time, but it's difficult to do that in the midst of a storm." Kelowna business leader, 2004

Each of these critical factors is reviewed in turn and suggestions made as to where Government and industry can collaborate to move the province forward.

Leadership

BC needs an independent and respected leadership forum to define a shared globally competitive vision for BC's Industrial Sector.

Given the emergence of a more integrated global economy, B.C. will face enormous economic adjustments over the next ten to fifteen years that will be even more challenging and far-reaching than those we have experienced this generation. The pace of change and growth will need to be faster than our competitors, if B.C. if it is to eliminate the "excellence gap" and achieve its potential.

According to BC manufacturers, leadership is the most important precondition for responding to the challenges and the opportunities that face industry in British Columbia. The objectives of strengthening the competitive and growth capabilities of BC manufacturers on one hand, and creating a supportive business environment that encourages investment, innovation, and economic prosperity on the other, can only be met if business strategies, public policies and programs are coordinated and aligned to strengthen BC's economic growth potential in the global markets of the future.

Opportunities

BC manufacturers represent a major economic driver in the province. And with operations spread throughout the province, they provide a strong network for enhancing economic growth in the province. Manufacturing is a knowledge- and technology-intensive, global enterprise offering career paths – not just jobs – for their employees, continuously investing in the education and skills of their workforce as a strategic part of asset management.

Manufacturing is a magnet for entrepreneurs and young people who see it as a conduit to careers in the field of advanced manufacturing and it has the critical mass to continue to drive the BC economy. It has the capability to support long term growth and development in the province and to stimulate more economic spin-offs from better global supply chain management.

British Columbia is well positioned to take advantage of the growth of the modern mass customization processes which are well suited to smaller open economies that are flexible, adaptable and operate within a supportive business environment.

As well, manufacturers in B.C. are much more confident and optimistic about the overall business environment than their counterparts in other provinces. Dramatically more BC manufacturing firms believe that the business environment is improving in this province than in other regions and ally. More than three quarters are very supportive of BC Government policy and optimistic about the province's future, compared with just over 2% of their counterparts in other provinces.

Challenges

- **British Columbia doesn't have a strategy to develop and expand the manufacturing sector in the province and to strengthen its capacity to build prosperity.**

Simply put, there is no long term vision or strategy in British Columbia today to help focus attention on what needs to be done to successfully meet the future challenges and drive B.C. to being "best-in-class" amongst the G7 and a region meeting is potential for liveability and prosperity.

BC manufacturers have failed to create such a strategy as they struggle to sustain the cash flow and profit to survive and to meet the changing global trends.

We must have an industrial strategy. We have to decide where our region will carve out its niche in this globalized economy, so we can continue to create and grow manufacturing jobs that pay family-supporting wages.

Ken Georgetti, CEO- Canada Labour Congress in Ottawa Life, October, 2005

The strategic horizon of business leaders is becoming shorter. The rapid pace of change now means immediate business interests are becoming all-consuming, obscuring the longer-term strategic view necessary for business planning. Just as importantly, the constant demand for manufacturers to keep their eye focussed on their business means

that they have less time to inform, educate and engage citizens and government about the valuable role and contribution of manufacturing to the provincial economy. A way needs to be found to move above the daily struggles and develop an overall strategic direction.

On the other hand, governments today are diverted by the immediate demands of its citizens to resolve a range of fundamental social policy issues, such as education and health care. Equally important are a broad range of policy issues such as land claims, land tenure and trade conflicts that are needed to support the growth of "traditional" resource based sectors. And Governments are concentrating significant effort on developing and promoting small niche markets that are enjoying dramatic growth rates.

All parties need to find a way to collaborate and to develop a new 2020 strategic direction that will benefit manufacturers and the province as a whole.

- **British Columbians are unaware of the contribution that manufacturing makes to the BC economy.**

Manufacturing may be the province's largest business sector, but British Columbians, both citizens and governments, are unaware of the significant contribution manufacturing makes to the

provincial economy and to their own economic prosperity. In a 2002 BC survey over 78% of the respondents thought manufacturing contributed less than 2% of provincial GDP and 84% of respondents indicated the sector contributed less than 4% of GDP. While it represents only 4% of provincial GDP, tourism topped the list amongst respondents as the largest sector and even small niche sub-sectors like bio-technology were rated by respondents as more significant.¹⁰

Not only is B.C.'s manufacturing sector not well known, it faces an ongoing perception as a smokestack industry of mass production and a dying "sunset industry". Views of manufacturing as 4D business - dirty, dangerous, depressing, and declining – are simply wrong. In reality, manufacturing jobs in BC are challenging, high skilled, high paying, full time and knowledge intensive positions that are propelling innovation and putting BC business on the global stage. Today, anyone visiting advanced manufacturing operations, from a Canfor sawmill to a Unifiller bakery equipment facility, to a Ballard fuel cells operation, to a Rampage video games facility, will find world leaders turning ideas into reality. These firms are creating knowledge-driven jobs, building careers and providing enormous benefits in communities across BC.

The failure of government and the public to understand the value of manufacturing rests squarely with the manufacturing community who have consistently failed for at least a decade to properly inform and educate British Columbians about their industry. The image of manufacturing must be changed to reflect the modern reality and BC manufacturers have to take responsibility for raising this awareness. Moreover, the image must be changed quickly because the rapidly changing market conditions, differences across sectors within the industry, and the increasing level of sophistication of products, technologies, and business organizations compounds the difficulties that governments, educational institutions, and business and financial services will have in responding to the changing needs of manufacturers.

- **Better communication, co-ordination and collaboration are essential to meet global competition.**

In BC there is clearly a need for better communication. But, there is also a need for a much greater degree of collaboration and coordination of effort. During Manufacturing 20/20 consultations in 2005, manufacturers across the province saw the benefit of working together more effectively to ensure they can cost-effectively manage their supply chains and business networks, share best practices, and where feasible, pool resources in order to leverage their access to qualified personnel, external sources of knowledge, business services, or financial support.

Manufacturers identified the need to build stronger working relationships with school systems, colleges, universities, and research centres. They also supported the creation of a more integrated approach on the part of all agencies and levels of government, educational and research institutions, business and financial services, aligned behind the single objective of providing the solutions required by manufacturers to enable customer success.

The success of manufacturing in British Columbia must be viewed as a priority crucial to the economic prosperity and well-being of all of us. New business strategies must be developed that can sustain growth in global markets. Public policies and programs must respond to the future requirements of manufacturing in global markets and enable business growth. And, together with their business partners, educational and research institutions, communities, labour groups, and all levels of government, manufacturers must be aligned behind coherent and integrated objectives aimed at enabling businesses to respond to the challenges and opportunities of a global marketplace.

¹⁰ In 2002 CME conducted a survey of 1,000 individuals in B.C. about their perceptions of manufacturing. While not a statistically significant sample, it gave an indication as to the thinking of BC residents about the manufacturing sector.

Goals

Leadership is fundamental to responding to the challenges and the opportunities that face industry. Manufacturers believe it is vital that BC create a “2020 Vision” for BC and that business strategies, public policies and programs be developed, coordinated and aligned to build a prosperous provincial economy. Better communication, co-ordination and collaboration are essential to global excellence.

BC needs an independent leadership forum to guide the vision and to provide the independent analysis and thinking needed to support achievement of our goal by 2020. And it needs to establish a target of being the best amongst G7 countries by that time.

Goals:

To develop a long term 20/20 strategy for British Columbia that will provide a framework for achieving the best overall score amongst G7 nations for industrial excellence.

To have the majority of British Columbians confirm manufacturing is the province’s economic driver, agree it is a “cool” place to work and help celebrate its business successes.

Recommendations for Action

In order to become “best-in-class” Government needs to...

- **Develop ambitious goals that can help transform BC over the next fifteen years, in encouraging each of the partners to do its part to achieve those goals, and in demonstrating the sustained political will required to stay on course.** It is critical to the future of the province that governments set stretch goals and work to achieve those. The future stakes for prosperity are high and government must act.
- **Establish an independent non-partisan leadership forum to develop the 20/20 strategy and to monitor its progress.** Many of B.C.’s prime competitors have developed independent organizations to define a future vision, to conduct research needed to clarify the vision, to encourage debate about innovative ideas, to monitor progress and to foster collaboration. B.C. needs to embrace this concept and create a similar type of organization. Such an entity would build upon the success of the B.C. Progress Board.
- **Formally recognize the importance of manufacturing to the economic prosperity of British Columbians and Canadians more generally.** Government needs to establish collaborative mechanisms similar to those created for high technology, tourism and forestry to provide for ongoing involvement and consultation by manufacturers at the highest levels of government. Manufacturers would prefer that Government establish a Ministry dedicated to the manufacturing sector since it rates as B.C.’s largest business sector, but it would settle for a Sector Council with a Minister of State or reporting to the Premier.
- **Partner with industry to provide guidance and practical help to companies that are upgrading their productive capabilities, improving health, safety, and environmental management, or expanding their businesses outside BC.** Governments elsewhere have taken a major leadership role in developing manufacturing. Models like the Manufacturing Extension Partnership in the United States and Business Innovation Networks in Australia

provide firm foundations for major public/sector collaboration and should be pursued in British Columbia.

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In order to become “best-in-class” Manufacturers need to...

- **Make a commitment to being world-class.** Business as usual is no longer a viable option for any manufacturer. New business strategies and new ways of operating are essential. Change management must become standard operating practice. Innovation must be at the heart of business planning, whether the objective is to rapidly reduce costs, increase customer value, or bring new products and services to market. B.C. manufacturers need to make a commitment to being:
 - Internationally cost competitive;
 - Globally accessible;
 - Providing practical solutions offering bottom-line benefits;
 - Flexible, customized, and capable of providing increasingly complex technological and business solutions; and,
 - Focused on rapid response.
- **Invest in information, marketing, and education campaigns.** Manufacturers need to become more actively engaged in raising awareness about modern manufacturing and the important contribution it makes to the BC economy in their neighbourhood and in their communities. Manufacturers have to “walk the talk”.
- **Work together with municipal and economic development authorities** to promote their communities as attractive locations for people to live and work.

Innovation

British Columbia manufacturers will be the G7 leaders in all aspects of innovation, including flexibility and continuous improvement.

Manufacturers innovate to solve business problems and remain profitable. They work to meet customer expectations, defend market share, and generate new sales opportunities by developing new and improved products and services. They aim to increase business and production efficiencies, lower costs, improve health and safety in the workplace, and reduce environmental impacts by implementing continuous improvement methodologies, using new materials, adopting new and improved technologies and processes. Some have their sights set on defining product or technological standards for their industry. Others innovate to meet new or different regulatory requirements or industry standards placed upon them or their colleagues.

Opportunities

BC manufacturers can draw from a well-developed innovation infrastructure in this province. The research capabilities of BC universities and colleges have been strengthened over the past ten years as a result of significant public and private investments made in recruiting top researchers, upgrading research facilities, and financing research overheads. A number of BC's colleges and universities are now recognized as world leaders in innovative research and centres of expertise aimed directly at product and materials innovation and the development and management of advanced manufacturing technologies.

BC manufacturers also have access to collaborative research initiatives being undertaken by academic and government research centres in the United States, the European Union, Japan, and other industrial countries.

“Lean thinking” is one of the most popular business improvement methodologies available to B.C. manufacturers. Lean business methods focus on eliminating waste in the form of all activities that do not contribute to customer value. They can be applied in manufacturing processes, materials management, inventory control, administration, sales & marketing, and across entire supply chains to align activities in the interest of customer demand.

Lean initiative Results	
•	84% reduction in lead time
•	75% reduction in rework
•	40 - 70% reduction in Work In Progress inventory
•	58% reduction in in-plant defects
•	59% reduction in product cycle-time
•	43% increase in parts per person per day
•	234% increase in plant-level profitability in 5 years
•	64% increase in units produced per person daily
•	95% reduction in lot size in last 5 years
•	43% reduction in material cost
•	98.87% machine up-time
Source: Industry Week and Shingo Prize	

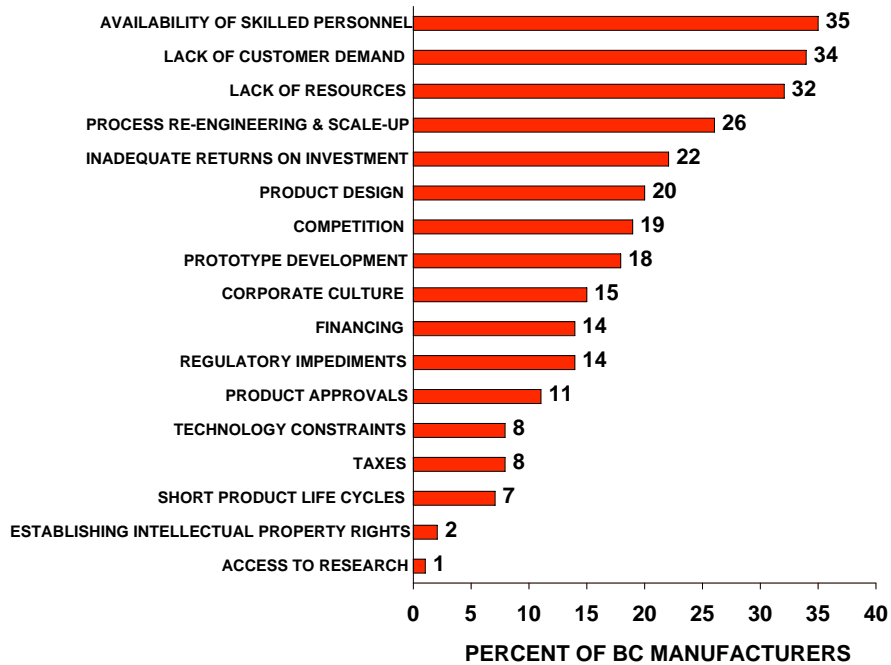
Today many BC manufacturers are embracing these process improvement techniques to improve performance, upgrade employee skill sets, improve operating efficiencies, change organizational culture, invest in new technologies, re-engineer processes, and develop new products and services. In general, the larger a company is in B.C., the more likely it has begun programs to improve performance.

Challenges

- **BC manufacturers often find it difficult and too costly to commercialize new products to meet customer needs.**

As noted earlier, BC manufacturers are not investing enough in innovation. Many haven't placed the required priority on innovation, investment in new technologies, or continuous improvement as their counterparts in other countries. Others have been able to rely on access into the North American market, a low dollar, and the ready availability of cost-competitive raw materials and energy. Smaller firms, in particular, have tended to lag behind their customers and competitors with respect to the commercialization of new and improved products or in the introduction of new and improved processes. All of those circumstances have now changed quite dramatically.

CONSTRAINTS ON NEW PRODUCT COMMERCIALIZATION



CME's 2004 Management Issues Survey defined a number of factors that impede firms' ability to be more innovative. One of the biggest challenges reported by manufacturers was the inability of many firms to properly commercialize new products. Firms lack the ability to design a product to meet customer needs and demands, conduct the prototyping and testing or process re-engineering required or to implement the scale-up necessary to go into full production. Manufacturers indicated that more effort needs to be directed to assisting them to commercialize new products and to improve the competitiveness of businesses. Greater emphasis was also needed on finding ways to increase skills acquisition related to improved commercialization and technology investments.

A relatively small number of manufacturers report difficulties in establishing intellectual property rights or accessing research from universities, colleges, or government laboratories. Financing is a constraint for small companies, particularly when market demand is weak and competitive pressures are strong. Most manufacturers finance research and the development of new products and services out of cash flow or working capital. Innovation budgets tend to be cut when profit margins or cash flow is under pressure and it becomes more difficult to raise working capital.

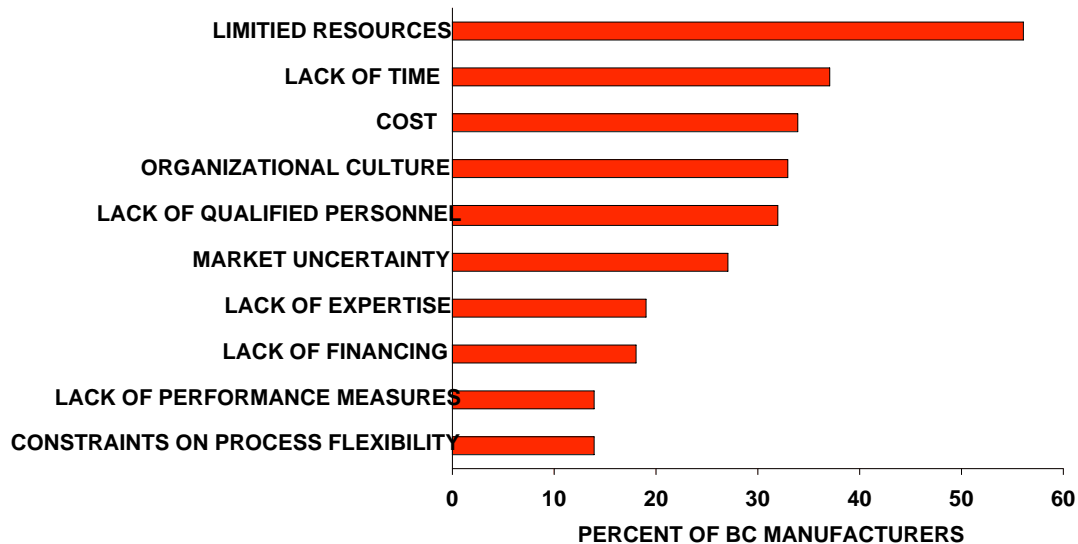
- **Too few BC manufacturers are implementing the principles of continuous improvement or "Lean Thinking" in all aspects of their business and production systems.**

While many BC manufacturers are world leaders in the use of tools for continuous improvement and report significant benefits from implementation, many find it difficult to go beyond current practices. Smaller companies, in particular, have trouble determining where to begin.

Regardless of company size, manufacturers report the need to learn more, to determine the continuous improvement methods most appropriate to their business, identify the experts, better understand what is involved in successful implementation, and share best practices with other practitioners. The most common constraints that they experience in achieving measurable

improvements in business performance are limited resources, lack of time, cost, lack of qualified personnel, market uncertainty, organizational culture and organization, availability of financing, and lack of customer demand.

TOP TEN CONSTRAINTS ON PROCESS IMPROVEMENT



BC manufacturers indicate that access to intelligence and expertise with respect to continuous improvement methodologies – and particularly Lean methods – needs to be improved. Lean and other continuous improvement methodologies are not widely taught in colleges, engineering, or business schools in Canada. Manufacturers note that on-line information, workshops, and seminars are useful, but not as valuable as demonstration and direct contact with experts and other practitioners. Companies outside urban centres find it more difficult to access the expertise they need.

Smaller and medium-sized manufacturers are looking for - but not finding - opportunities to share best practices and collaborate in various consortia working on process improvements. These firms cite a need to link local collaborative efforts to best practice and expertise from across Canada and around the world.

- **BC manufacturers need to invest more in advanced information and manufacturing technologies, and improve their management of those technologies.**

Manufacturers, throughout the province, fund technology investments from cash-flow from operations rather than from debt or equity. In the 1990s when a falling Canadian dollar boosted profits for BC industry, manufacturers preferred to invest in labour, which was relatively less expensive than the new technologies they had to import at higher exchange rates. Today, with the Canadian dollar at \$0.85, the relative cost of technology has fallen and the rate of capital investment has increased. However, there are new bottom-line pressures in the form of falling product prices, declining export sales, and higher costs for energy and materials that constrain cash flow performance and make it harder for businesses to make the required investments in new technology.

Manufacturers feel further effort needs to be made through the tax system in BC to accelerate the rate of investment in technology in order to eliminate the “excellence gap”. Scientific Research and Experimental Development (SR&ED) tax credits assist some B.C. firms to develop new products, but manufacturers feel the program doesn’t assist with a range of their critical

technology activities, such as new product commercialization, process improvements or innovation enhancements that are vital to enhancing innovation growth rates than new product development. Over 60% of B.C. manufacturers don't use the existing SR&ED program because it doesn't help address operations innovations (48%) or it's too burdensome to apply (20%).

Manufacturers also report significant challenges in recruiting or retaining personnel with the skills and experience they require in new advanced technological processes. Attracting new talent to the province is often difficult and time consuming and B.C. is competing against firms globally. New investment and product innovations are also often hampered by slow, complex, and expensive regulatory approval processes.

Smaller manufacturers indicate that they have difficulties keeping up with the pace of technological change. Many firms are unaware of the resources and support networks available to them, or unable to finance emerging technologies that could greatly improve quality, reduce lead times, and lower costs. Many companies rely on the National Research Council's IRAP technology advisers. However, there is general concern across the province that government programs in support of manufacturing technology management are insufficiently resourced, out-of-date, or too difficult to access.

- **BC manufacturers feel the public innovation infrastructure at universities in the province lack the coherence and coordination that are necessary to deliver integrated solutions to manufacturers.**

Many BC manufacturers complain that the knowledge that is being generated through publicly funded research is not applicable to solving the market, technical, or business problems that they face in the province in trying to become global competitors. During the Manufacturing 20/20 consultation process there was widespread concern within the industry that the research being carried out in universities, colleges, and government laboratories is not directly applicable to what they need, or not easily accessible.

The present innovation policies of both levels of government are focused heavily on providing financial support for academic research activities in universities and government laboratories. Manufacturers feel there are too few linkages between these academically driven research activities and the needs of industry, and limited capability for manufacturers to access the best or the most applicable body of knowledge from across Canada, or from other countries.

Manufacturers also feel that the government commercialization strategies fail to recognize the needs of existing businesses to innovate and to develop market focused products and services. B.C.'s manufacturers believe the governments' policies need to be refocused so more effort is placed on a technology-pull strategy, whereby resources are directed on the outcomes of research as viewed from a market perspective and in support of the competitive requirements of business rather than the present technology-push approach to the issue, where the principle objective is to "create" knowledge within academia and then to seek out customers and commercialize these ideas through licensing arrangements, collaborative ventures with industry, or green field business start-ups.

Manufacturers also believe that collaboration among manufacturers and their suppliers, or between industry and publicly funded research centres, is not well developed and needs to be strengthened. There are few liaison programs with limited funding available either to increase awareness about innovation needs and research capabilities or to marry publicly funded R&D activities up with the requirements of manufacturers either locally or across the country.

Goals

Innovation is the key to success in global markets and is characterized by intense competition, rapid technological change, increasing constraints on the supply of skilled labour, energy, and natural resources, and more demanding customers and stakeholders.

British Columbia needs an innovation infrastructure that:

- Responds to and supports the needs of manufacturers;
- Enables manufacturers to access and share best practice expertise with respect to continuous improvement and technology management at a local level as well as across Canada and with experts in other countries;
- Encourages investment in advanced information, materials, and production technologies;
- Focuses publicly funded applied research toward the needs of industry and strengthens collaboration between industry and centres of academic and government research; and,
- Is supported by a tax and regulatory environment that encourages innovation and investment in new technologies; and by an education and training system that prepares British Columbians with the skills and experience required in an advanced manufacturing workplace.

Goal

BC manufacturers will be G7 leaders in all aspects of innovation, including flexibility and continuous improvement by 2020.

Recommendations for Action

In order to become “best-in-class” Government needs to...

- Develop a more integrated approach in providing support to manufacturers across BC. Manufacturers need easy access to best practices and technological and management expertise from within BC, across Canada, as well as from other countries. Stronger linkages reaching across institutional boundaries are needed among manufacturers, universities, colleges, and research centres. At the same time, a more coordinated approach is needed in building local centres of business excellence based on combining innovation and manufacturing strengths resident in local communities. Government can help strengthen linkages between manufacturers and local commercialization resources, including local technology companies, academic and government research centres, business services, and sources of finance.
- Provide financial support for the establishment of manufacturing consortia and other collaborative initiatives aimed at sharing best practices and undertaking joint training or improvement projects. Evidence in the United States has shown that government/ industry programs like the Manufacturers Extension Partnership accelerate the pace of innovation while being cost effective and of net benefit to the economy. The MEP evaluation indicated that for every \$1 invested in the activities, some \$22 in economic activity was created and \$7 in tax revenue was generated.
- Expand the scope of the Scientific Research & Experimental Development tax credit program to include product design, engineering, prototyping, process improvement and market development. Broadening the eligibility criteria to address commercialization and process improvements would encourage private sector investment, generate increased productivity and improve profitability.

Tie federal and provincial funding for applied research to criteria that balance collaboration between researchers and industry with scientific merit and research capacity, education benefits, industry need and market potential. Many research programs in G7 countries include greater use of project funding as opposed to institutional block grants, link more research funding to private sector investments and foster multi-disciplinary research in fields of interest.

In order to become “best-in-class” Manufacturers need to...

- Commit to increasing their investments in innovation in concert with increased government investment. Manufacturers invested more than \$475 million last year in research and development, but there is a need for significantly higher investments if the province is to innovate at the rate it needs to compete globally. Manufacturers need to be encouraged to make more investments.
- Build and sustain their commitment to continuous improvement throughout their organizations. A commitment to ongoing process improvements or “Lean Thinking” has proven to be a significant contributor to lower costs, greater efficiency, lower waste and higher profits – a true sustainability tool. Manufacturers need to become aware of these forms of continuous improvement and engage more broadly in the programs.
- Increase collaborative efforts in innovative research, design, and product development, sharing best practices, and pooling resources to acquire the expertise they need to implement continuous improvement programs. More B.C. manufacturers need to engage in collaborative forums or join lean consortia in order to take advantage of a broader base of knowledge needed to compete globally.
- Become more engaged in designing and supporting the R&D activities of BC’s colleges and universities. More B.C. manufacturers need to engage with universities and colleges in applied research activities and in working to increase product commercialization. More manufacturers also need to take advantage of the Industrial Research Assistance Program (IRAP) and the technical advisory services that they provide across the province.

Workforce Capabilities

The province’s workforce must be ready and able to meet the future requirements of manufacturing.

Business success depends on people. BC manufacturers know their businesses will only be as competitive as the capabilities of their workforce allow. BC manufacturers participating in CME’s 2004 Management Issues Survey noted that available and qualified personnel are critical to innovation activities (82%), fundamental to meet changing business practices (64%) and a significant factor in their firm’s location decisions (32%).

In order to become globally competitive, BC’s manufacturers will need to have a workforce that is highly knowledgeable, highly skilled, highly experienced, and highly flexible if they are to meet the strategic challenges that lie ahead for the industry. Moreover, employees will not only have to be flexible enough to adapt to changes in their job, but willing and able to continuously upgrade their knowledge and skills on a path of life-long learning.

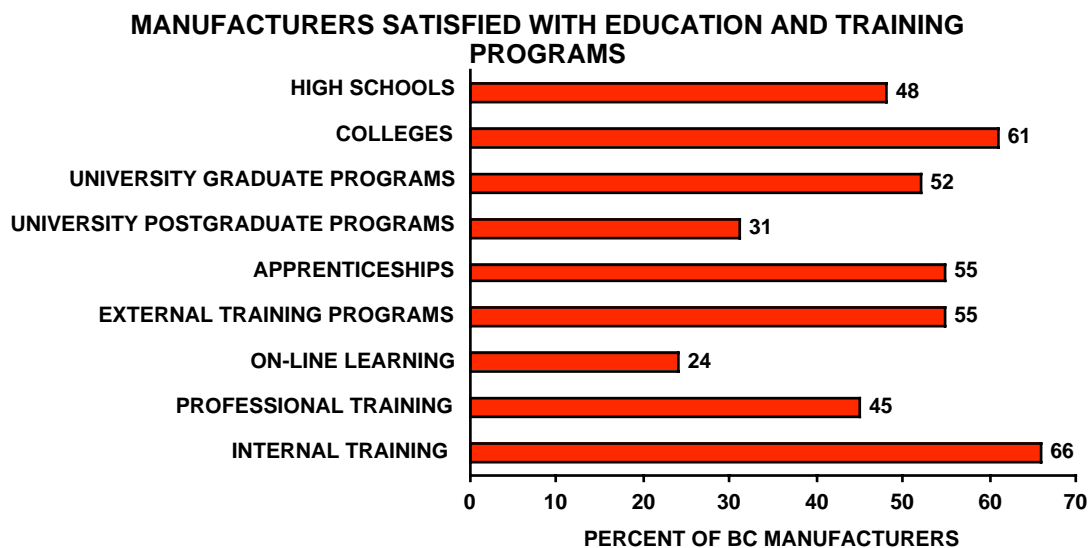
While it’s impossible for manufacturers to predict their future demands with precision, B.C. manufacturers indicated in the 2004 Management Issues Survey that the skill requirements they will need include:

- A mix of creative problem-solving capabilities, technical know-how, business skills, and an ability to interact with colleagues and customers;
- A higher degree of technical and technological expertise;
- Greater combinations of trade, technical and business skills;
- A greater reliance on manufacturing and product engineering, product and process design, and scientific research;
- Much more multilingual and multicultural skills;
- Management skills in the fields of manufacturing processes, supply chains, product and knowledge development, financing, and global business; and,
- An ability to adapt easily to constantly-changing roles in a constantly-changing workplace.

Manufacturers also recognize that labour-management relations must become more collaborative, because the parties need to develop new means to protect worker rights, while ensuring companies have the flexibility to implement modern manufacturing systems. Today's manufacturing systems require more and more responsibility for decision-making to be passed to workers at all levels of business, requiring a more seamless alignment of responsibilities, competencies, training, recognition, and rewards. Even a highly skilled workforce will not be able to adapt to the demands of the global marketplace if workplace relationships are still based on "traditional production systems", with hierarchical top-down decision making that is focused on repetitive activity.

Opportunities

BC can boast of one of the most highly educated and skilled workforces in the world. A number of excellent educational and training facilities exist across the province – in high schools, colleges, and universities – where educators are working with people in industry to ensure that graduates are prepared to meet the requirements of a modern manufacturing workforce. Some 61% of participants in CME's 2004 Management Issues Survey say that community colleges and institutes of technology are either effective or very effective in meeting their requirements, while the approval rating is 52% for university graduate programs and 48% for high schools.



Various training organizations are coordinating training needs at a regional, provincial, and national level. Manufacturers, together with colleges, training organizations, sector councils, and governments are working to strengthen apprenticeship programs and increase the availability of skilled trades people.

Many manufacturers invest heavily in developing and upgrading the skills of their workers. Some have developed specialized skills training programs or institutes that benefit the community at large. BC's manufacturers have also relied upon the skills and entrepreneurial talent of new immigrants coming to the province to access skilled personnel. At the same time, many companies have made significant improvements in their innovative capabilities, workplace efficiencies, flexibility, and levels of customer satisfaction based on the adoption of more flexible and more collaborative workplace practices.

A majority of BC manufacturers participating in CME's 2004 Management Issues Survey say that workplace practices designed to attract and retain employees are important parts of their strategies to meet future labour needs. Some of the most common incentives that manufacturers currently use in this regard are higher levels of overtime pay, flexible work schedules, time-off for extra hours work, short leave time for personal issues, support for worker education and training, compensation-based performance incentives, flexibility to deal with child-related issues, compressed workweeks, and employee wellness programs. Attractive workforce practices will become even more important in the future as competition for skilled labour increases.

Challenges

- **Employees often don't have the basic skills required to work in a responsible, innovative, highly flexible, and internationally networked business environment, or the capability to improve their capabilities.**

According to CME's 2004 Management Issues Survey, BC manufacturers report rising difficulties in finding entry-level employees with the skill sets they require for further training. Over one-third of BC manufacturers say that the problem-solving and teamwork skills of their workforce are less than satisfactory, while 24% of companies say that the basic employability and literacy skills of their employees are not up to the standards they require.¹¹

The reasons that BC manufacturers give for rejecting job applications provides another way of assessing the basic skills required for employment in modern manufacturing. According to CME's 2004 Management Issues Survey, 41% of firms say that they reject job applicants as a result of poor references from previous employers; 34% because applicants have inadequate work experience or do not possess adequate employability skills; 17% because applicants lack adequate communication skills; and 14% because of poor problem-solving capabilities.

Manufacturers see the primary school system in BC as lagging behind those in other countries in reading, writing, mathematics, and science. High schools are not effectively equipping the workforce with basic employability skill, including discipline and responsibility for health and safety. There are not enough opportunities for young people to enter into technical education or trades training programs in BC's high schools. Technical programs have been cut back in many school systems.

Those aspects of BC's primary and secondary educational curriculum most in need of improvement include problem-solving, trades and vocational training, personal responsibility and

¹¹ Employability skills are defined as the ability to come to work on time on a consistent basis, responsibility for personal behaviour and the health and safety of others, and the discipline required carry out tasks expected of the position an employee holds.

basic employability skills. Almost 62% of BC manufacturers participating in the 2004 Management Issues Survey identified problem-solving as a skill in need of improvement within the primary and secondary school curriculum. Over 40% identified personal responsibility and basic employability and decision-making skills along with technical and vocational skills as areas in need of improvement.

In addition to basic skills, more and more manufacturers are reporting a shortage of people with business skills and practical experience. Senior people are retiring, leaving a gap in both knowledge and experience. Young people are graduating with academic and technical skills, but without the practical experience or wisdom to know how to make things work. Manufacturers identify a lack of training in manufacturing management at the post-secondary level, including strategic thinking, understanding of manufacturing, entrepreneurship, finance, technical and operational management, and the management of innovation. Middle management and supervisory skills need to be improved.

With the Organization for Economic Co-operation and Economic Development (OECD) reporting that private firms in Canada are doing 78% of skills specific research and given the satisfaction firms have with internal training, manufacturers believe that greater encouragement should be provided to firms to meet this training challenge.¹²

- **Manufacturers need to invest more in continually upgrading the skills and capabilities of their workforce, and strengthen collaborative efforts in skills training.**

High training costs associated with advanced manufacturing technologies mean that people with skills in these areas are extremely difficult to find either within industry or from the educational system. However, B.C. manufacturers aren't investing enough in workforce development.

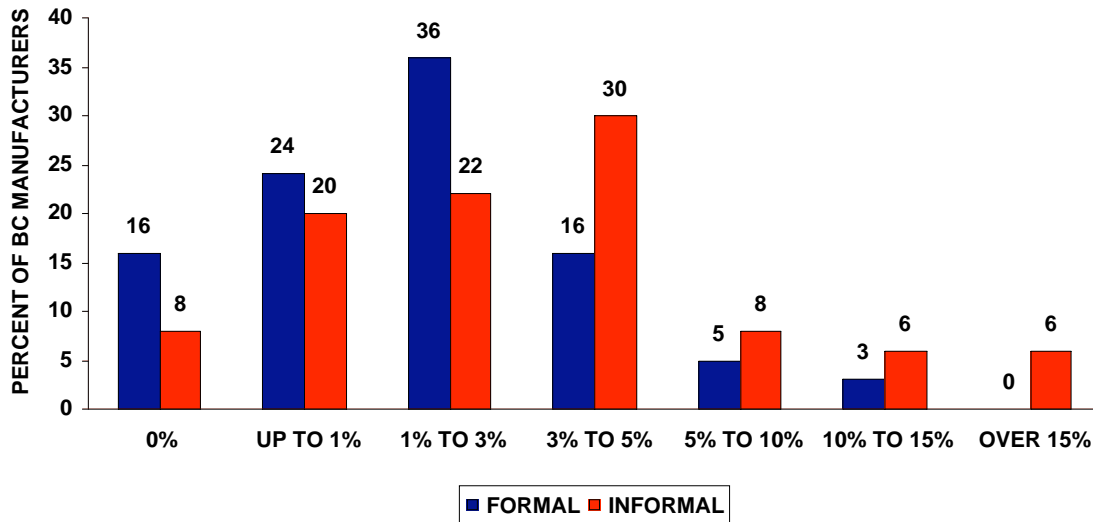
Due to bottom line pressures, B.C. manufacturers on average invest a relatively small proportion of their total payroll in formal skills training, about 2.4% of payroll¹³ – approximately one-fifth of the amount invested in Japanese manufacturing and three-quarters of that invested in the U.S. However, a larger percentage of firms do not invest in any informal training for their employees.

According to CME's 2004 Management Issues Survey, almost half of manufacturers in BC (44%) invested less than 1% of their total payroll in formal training programs while 28% invested less than 1% of payroll in informal training. In contrast, 24% of firms invested over 3% of payroll in formal training, but 50% invested a similar amount of payroll in informal training programs.

¹² OECD Employment Outlook, 2003 pg. 277.

¹³ R.A. Malatest " " pg. xx

INVESTMENT IN SKILLS TRAINING (PERCENT OF PAYROLL)



Fewer than half of the manufacturers participating in the 2004 Management Issues Survey invested in either formal or informal training with respect to such critical aspects of their business such as the upgrading of workplace skills, continuous improvement, or even the orientation of new employees. Slightly over half invest in upgrading the technical skills of their workforce. Workforce training is viewed too frequently as an expense rather than an investment in developing and maintaining productive assets. Skills training budgets are among the first that businesses tend to cut when facing cash flow problems.

Manufacturers report that they are constrained in their in-house training by increasing training costs, the rising complexity of training to meet new technologies and operating procedures, and insufficient in-house expertise to support corporate training, apprenticeships, and cooperative programs. Smaller firms in particular can ill afford to devote the personnel or the resources.

More specialized skills requirements are also forcing companies, especially smaller ones, to outsource professionals or consultants for specific functions rather than developing the skills of their own workforce.

- **Apprenticeship programs need to be improved to meet the changing skills requirements of manufacturing.**

In recent years, trades training and apprenticeships have been perceived as vocational paths for the academically challenged that lead to manual, uninteresting, low-paying jobs. Lesser qualified students have been streamed into trades training programs and this has led to fewer trained students and higher drop out rates. As well, rapidly rising costs for the equipment needed to teach technical skills has caused many school districts to reduce or eliminate their trades training programs and to pass those training requirements on to industry.

The effort by the BC Government to create the Industry Training Authority is a positive step, but the transition process has been difficult and disrupting for many manufacturers. Just as the province was re-aligning its trades training, many BC manufacturers have been seeking to access the apprenticeship system, but finding the program in crisis.

More companies are now being forced to do their own training and are not relying on provincial programs. Bigger companies are doing their own training, but not to provincial apprenticeship regulations. Many manufacturers are not aware of the present government training systems and therefore the majority do not make use of the training, apprenticeship, and cooperative programs available to them. Most are unaware of the new programs, or how to participate.

It is difficult for small companies to support training and apprenticeship programs, especially when the worker decides not to pursue the job. It is difficult for any company under cash constraints to dedicate resources to provide adequate supervision for interns and students in cooperative programs. Manufacturers also complain that many training and apprenticeship programs appear beneficial initially, but end up with too much paperwork or too many regulatory provisions to deal to make participation worthwhile.

Manufacturers are reticent to invest in apprenticeship programs because of the risk that apprentices, once they attain a high level of proficiency or obtain their papers, will leave for more attractive employment opportunities. The problem is especially acute in smaller companies as well as in regions outside major urban areas of the country.

At the same time, many people are not prepared to stay in apprenticeship programs. Drop out rates are high. Training programs are sometimes offered in colleges that are remote from the companies in which apprentices are employed. And, some apprenticeship programs do not provide the skill sets that manufacturers say they require.

- **The immigration system isn't being employed effectively enough for manufacturers to obtain the skilled and experienced personnel they require.**

While manufacturers face shortages of qualified staff, most are unable to access qualified immigrants to fill positions. Most manufacturers in BC are unaware of the provisions of the Immigration Act that would allow for the nomination and entry of skilled workers and few use the program. There is general agreement that B.C.'s nominee program is not working well.

The federal Government's new immigration rules for immigrants do not correspond to the skills requirements of manufacturers, which mean many skilled and experienced trades' people are denied entry because their academic credentials are under rated in the new points system. As well, the system makes it difficult to match the skills available within the pool of new immigrants to the actual requirements of companies. There is little attention given in the immigration selection process to matching skills with employment requirements.

Approval processes for new immigrants, as well as for visas for individuals traveling to Canada for business purposes, are too long and complex. The delays experienced in processing entry applications to Canada mean that BC industry is losing skilled workers to countries like Australia and the United States, where procedures tend to be more streamlined.

New immigrants often lack the linguistic and cultural skills to integrate easily into the BC workforce. The skills and work experience of immigrants are often difficult to assess, while their integration into the workforce is delayed and frequently impeded by the need to obtain Canadian accreditation and work references. Communities outside urban centres in BC find it difficult to attract and retain immigrant workers.

- **Manufacturers need to ensure that labour relations and employment practices encourage the attraction and retention of skilled and experienced employees, and the continuous improvement of employee capabilities.**

Manufacturers are facing a looming wave of retirements and the loss of people with valuable skill sets and experience. The next cohort of senior employees is much smaller. Companies will

therefore depend on recruiting new talent. But, skill sets that are being lost will not easily be replaced and experience is often lacking in new recruits.

According to CME's 2004 Management Issues Survey, manufacturers report that they are taking some actions to address their current and future labour needs, but more effort is required. Most will depend on upgrading the skills of their existing workforce, placing a higher priority on recruitment, relying on employment benefits to retain qualified personnel, and accessing new pools of skilled labour – including women, First Nations, and recent immigrants to Canada.

Goals

“The province’s workforce must be prepared to meet the future requirements of manufacturing.”

When developing this capability there is a need to ensure that:

- Careers in manufacturing are viewed as attractive opportunities for young people;
- British Columbians have the basic skills required to work in a responsible, innovative, highly flexible, and internationally networked business environment, and be able to take every opportunity to improve their capabilities;
- BC's education system graduates young people with the mix of specialized technical and business skills and experience required by manufacturers;
- Apprenticeship programs meet the changing skills requirements of manufacturing;
- Manufacturers invest more in continually upgrading the skills and capabilities of their workforce, and strengthen collaborative efforts in skills training;
- Canada's immigration system enables better access for manufacturers to skilled and experienced personnel; and,
- Workplace and employment practices encourage the attraction and retention of skilled and experienced employees, and the continuous improvement of employee capabilities.

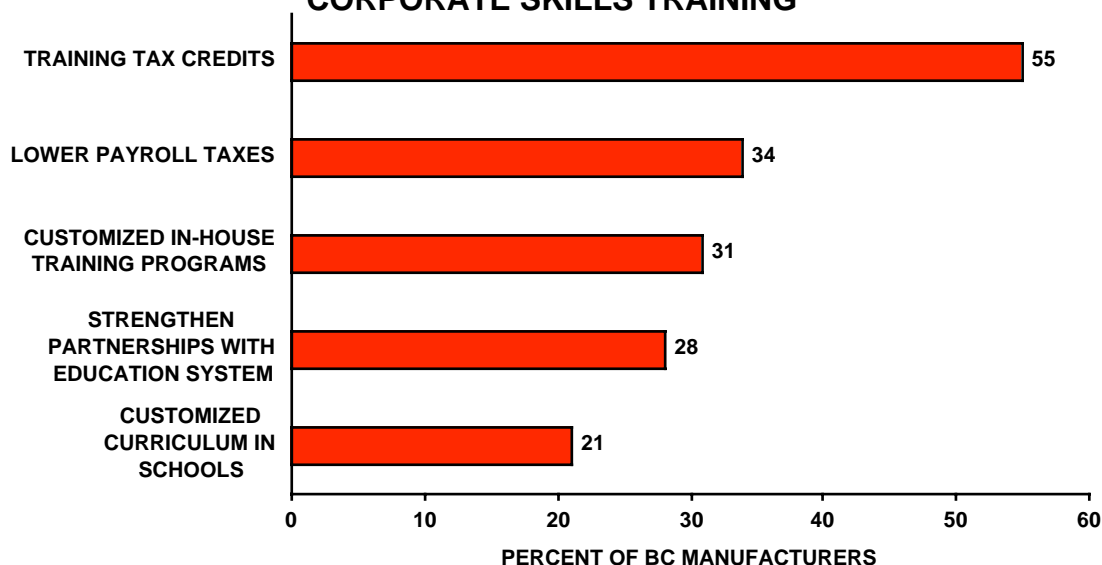
Recommendations for Action

In order to become “best-in-class” Government needs to...

As one component to closing the gap on labour productivity and unit labour costs,

- Provide tax incentives to encourage manufacturers' efforts to implement firm specific training and to encourage workers to take skills related training. The trades should be on a par with professional training programs in terms of the commitment of public funding in British Columbia. BC manufacturers recommend training tax credits and a reduction in payroll taxes as two fiscal mechanisms that would encourage more investment in in-house training efforts. Such credits are provided in six European countries and 18 US states.

TOP FIVE RECOMMENDATIONS TO INCREASE CORPORATE SKILLS TRAINING



- Ensure that labour laws and regulations provide employers with the flexibility to access the skills and capabilities they require to compete successfully. Regulations affecting workplace health and safety should be administered effectively at the lowest possible compliance costs to business. Compliance requirements should be simplified, rationalized, and harmonized across provincial jurisdictions.
- Fund a provincial manufacturers' advisory council to facilitate the design, implementation and funding of manufacturing related training programs. Advisory councils are used across Canada and in many regions of the world to provide a forum for collaboration and co-ordination amongst government, industry, academia and labour. Such an entity should be led by industry and supported by government.
- Improve the provincial nominee system for immigration. BC's immigration system should target immigrants with the technical and trades skills required by manufacturers. Entry procedures for immigrants nominated by manufacturers should be fast-tracked. A maximum three-month processing period is recommended for skilled immigrants selected by manufacturers; and, a maximum one-month processing period is recommended for the processing of business visas if a reference from a Canadian business is also provided.

In order to become “best-in-class” Manufacturers need to...

- Increase investments in skills upgrading to help eliminate the performance gap. The initial target should be to double their investment in formal and informal skills training from 2.4% of payroll or \$200 million annually to 5% of payroll or \$400 million annually.
- Establish and cost share with government a public awareness program to do a better job of communicating the career opportunities available to young people in the industry. Greater efforts need to be made to make students and immigrants aware of the opportunities available in the manufacturing sector, the significant level of skills required to operate within the sector and the high wages and benefits associated with the industry.

- Lead the design and implementation of a Manufacturing Advisory Council. Manufacturers should collaborate with labour groups, sector councils, colleges, apprenticeship and other trades training organizations to identify future skills requirements and help design educational and training programs that are relevant to their business. They also need to work with governments to develop more opportunities for hands-on instruction by practitioners within companies, develop more customized, modular training programs that can be delivered to companies on a just-in-time basis and develop more cooperative programs and practicum based programs.

Governments, academia and industry need to look for collaborative ways to lower training costs, share best practice in training procedures, and pool resources in shared training programs.

Smaller manufacturers should have more collaborative opportunities to share human resource planning and training resources, best practice, and evaluation tools – and, where feasible, skilled personnel.

- Partner with colleges and other programs providing linguistic and cultural training for immigrants. Manufacturers, colleges, universities, unions, trades and professional associations should establish a system for better recognizing the educational background, skills, professional credentials, and experience of recent immigrants.
- Develop more collaborative relationships with labour. Manufacturers need to work more collaboratively with labour organizations to ensure that workplace practices are developed with the flexibility and incentive structures in place that will allow for enhanced productivity and the attraction and retention of skilled workers.

A Competitive Business Environment

British Columbia must become the preferred location in North America for manufacturers to locate, invest, trade, employ, and grow.

BC manufacturers operate in a global marketplace that requires them to become and remain internationally competitive. As the world economy has expanded and new developing countries like China, India and Brazil become global economic forces, the challenges for BC manufacturers are growing and a competitive business environment has now become crucial to survival.

As mentioned earlier, firms in BC now have just twelve minutes out of each eight hour day to make the money required to invest in market development, product innovations, process improvements, organizational changes, workforce training, and new technologies necessary for sustaining competitive success. Therefore, every dollar spent on taxation or unnecessary regulation reduces the ability of firms to compete. Escalating taxation and regulatory compliance requirements can threaten business survival.

Governments, on the other hand, need to establish a tax system that motivates people's desire to work, invest, and engage in entrepreneurial activities, while still providing the appropriate revenues to ensure that both the province's high quality of life and a prosperous business environment are maintained, and a regulatory system that protects society without unduly impacting on business.

“Taxation and regulatory policies (in BC) must be designed with a view to keeping overall business production costs competitive... competitive taxation and regulatory policies are essential to encourage the investment spending that leads to technological innovation and upgrading, higher productivity and lower productions costs.” [BC Progress Board – 2002

A competitive business environment is critical to the ability of BC manufacturers to operate in a global environment, where the factors of production are mobile and there is significant competition amongst countries and regions for business. Achieving the right balance is critical to ensuring BC firms can become and remain globally competitive.

On the taxation front, BC needs a tax system that is:

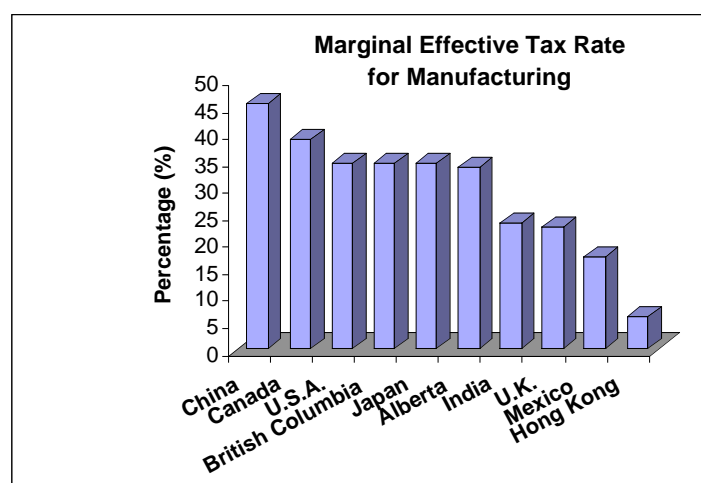
- **Equitable**, raising revenue in a transparent fashion from those most able to afford it and where it is least likely to impose hardship and,
- **Efficient**, limiting the negative impact those taxes can have on decisions to engage in productive economic activities.

And on the regulatory front, BC needs a system that protects society and the environment while increasing effectiveness and reducing cost – in many cases these can be achieved simultaneously.

Opportunities

BC manufacturers recognize that they are operating within a rapidly improving business environment in British Columbia and they acknowledge that these policies are helping them to lead economic growth in the province. B.C manufacturers are optimistic about the provincial economy and see the outlook improving (+35%), while most manufacturers across Canada see the outlook for taxation getting worse (-40%).

The British Columbia Government has made a concerted effort to reduce business taxation and today BC's marginal effective tax rate of 34.4% for manufacturing now compares favourably with Canada (38.9%), U.S.A. (34.6%) and Japan (34.4%) and is just slightly higher than Alberta (33.7%).¹⁴



Source: CD Howe Institute

BC manufacturers have benefited from significant strides towards equity and efficiency in the province over the past three years that have helped to improve cash flow and support business improvements. These tax benefits include:

¹⁴ China's high effective tax rate of 45.5% is misleading because it incorporates a 28% value added tax (VAT) on machinery that is often reduced or eliminated as part of China's concessionary tax regimes. As a result businesses often pay less than half the official tax rates.

- Reductions in the top personal marginal tax rate from 54.2% to 43.7%, second lowest in Canada and just behind Alberta at 39%. This has been an important factor in the jurisdiction's ability to attract and retain skilled workers.
- Elimination of the sales tax on manufacturing equipment in 2001 has helped improve business cash flow.
- Elimination of the capital tax has resulted in significant increases in capital investment in the manufacturing sector and helped the rapid rise in the sector's productivity in the past two years.
- The recent reduction in corporate taxes from 13% to 12% is expected to stimulate further investment by increasing corporate profit margins.

With respect to regulatory reform, the 2004 Manufacturers Management Issues survey showed that twice as many BC Manufacturers believed the overall regulatory environment in the province was getting better than thought it was getting worse. On the other hand, Canadian manufacturers are overwhelmingly negative about the regulatory environment nationally and in most provinces across the country.

BC manufacturers are also very positive about the Government's commitment to regulatory reform. They are happy with the progress that the BC Government has made since 2001 to reduce the number of regulations by 144,535 and bringing the province's regulatory systems more in line with those in competing jurisdictions like Alberta and Washington State.

Some of the positive impacts of regulatory improvements on manufacturers include:

- Streamlining of the business regulatory environment through the Business Corporation Act and the creation of the corporate on-line reporting systems has made it easier to do business.
- Amendments to the *Small Business Venture Capital Act* in 2003 that allow small businesses to provide tax credits to investors for risk capital investment was a useful mechanism to raise more capital funding, although manufacturers would support higher limits to maximize the impact of the program.
- Changes to the labour code and employment standards that allowed firms to operate with more flexibility in a competitive environment.
- Implementation of a more results-oriented approach to regulation that puts greater emphasis on action rather than process and is guided more by appropriate risk management than total risk aversion. The new *Environmental Management Act (EMA)* and the *Integrated Pest Management Act* are good examples of the use of results-based frameworks that balance risk and results.
- Changes to training systems to increase the use of competency based assessments and provide for more variety in training options by employers and employees.
- Improvements in the Workers Compensation Board processes to make it more service oriented.

BC Manufacturers believe the present BC government commitment to regulatory reform is improving the province's international competitiveness position, but further improvements have the potential to make the province the **most liveable AND competitive place on earth**. BC manufacturers are not interested in eliminating regulation; rather they seek a greater emphasis on achieving the most efficient and effective regulatory climate at the lowest possible costs for compliance.

Taxation Challenges

While the BC Government has made significant strides in improving the tax equality, BC manufacturers still confront equity issues that have negative impacts on their operations.

- **BC's manufacturers need to have marginal effective tax rates that allow them to compete globally**

With relentless global competition and rising input costs, manufacturers need to have the most competitive business climate possible to profitably operate in markets around the world. While the chart above shows BC now has a generally competitive rate with its traditional trade partners, the CD Howe Institute research has shown that BC's marginal tax rates for manufacturing are still the fourth highest in the country, lower only than Ontario, Quebec and Saskatchewan. The rates are the sixth highest out of a field of 36 countries monitored by the Institute in 2005.¹⁵ As well, these marginal effective tax rates are significantly higher than those for the province's emerging competitor nations like India (23.2%), Mexico (17.2%) and Ireland (14.1%) and well above traditional rivals like the U.K. (22.7%) and Hong Kong (6.1%). Moreover, many OECD and other countries have been cutting their business taxes faster than they have in Canada and B.C.

In B.C. the higher effective marginal tax rates on the last dollar earned often reaches 80 per cent of every \$1 invested and 60 percent of each additional dollar in employment income. This continues to impede the ability of manufacturers to fund the full range of investments needed to eliminate the province's excellence gap.

The federal government decision this year to postpone a planned reduction in corporate income taxes in 2008 will also make it more difficult for BC manufacturers to compete.

- **BC manufacturers need to increase the speed at which they adopt new technology in order to increase productivity and improve provincial prosperity.**

While traditional life cycles for production equipment were 8-10 years, the speed of global change often require BC firms to adopt new technology with life cycles as short as six months. To keep abreast with changing technology change, firms need to reinvest constantly, but the present capital depreciation laws discourage B.C. manufacturers from making those investments as quickly as required. This has contributed to the under investment in technology, thereby stifling labour productivity improvements and slowing growth.

Over 43% of BC manufacturers and 34% of manufacturers nationally believe that accelerated capital cost allowances will convince them to make the investments necessary to expand the economy and Finance Canada research shows that this faster depreciation will lead to greater economic activity. A recent Finance Canada study concluded that spreading the asset costs over a shorter period and getting the tax benefits of the investment sooner makes the average Canadian better off by \$1.40 for every dollar of tax revenue lost.¹⁶ In turn, with manufacturing generating \$3.01 in total economic activity for each \$1 invested directly, these accelerated capital cost allowances can create significant economic benefits that will more than pay for themselves.

- **Municipal taxation is punishing manufacturers in many BC communities and is negatively impacting on the ability of firms to invest in new plant and equipment.**

BC manufacturers are gaining confidence in the provincial government's fiscal policy, but there is rising concern amongst many of these firms about the rising inequity in tax rates charged

¹⁵ Mintz, Jack "The 2005 Tax Competitiveness Report: Unleashing the Tiger", C.D. Howe Institute, pg. 6

¹⁶ Canada, Department of Finance (2004).

manufacturers when compared to residential tax payers in many BC communities. In the 2004 Management Issues Survey, not a single respondent thought the municipal taxation outlook was improving, while 28% of respondents felt municipal taxation was getting significantly worse. These results were twice as high as those reported nationally.

BC's municipal legislation allows communities to charge whatever property tax rates they find appropriate and this has led to a significant variability of rates across the province and a rate structure in some communities that is substantially higher than those charged in many regions of the country. High property tax rates can be a very significant cost factor for businesses and determine if a firm can remain in business, or is able to make new investments.

To illustrate, a 5 percent annual property tax bill today would be equal to the cost of investment capital on a BC project amortized over 20 years. This means a manufacturer paying 5% tax rates is essentially paying double for their investment over that period. Put another way, it is the equivalent of a residential property owner paying taxes equal to their monthly mortgage payments, a situation many residential B.C. homeowners would be unable to afford.

A recent study on municipal taxation found that the median business taxation rate in BC communities is up to five times higher than the residential tax rates, thereby placing a disproportionate tax burden on business. The study found that median ratio of business to residential tax rates in 2003 was 4.61 for utilities, 4.01 for major industry, 2.91 for light industry and 2.28 for business.¹⁷ Median tax rates for most manufacturers is 3.3% in BC versus 1.17% for residential tax payers, but in some municipalities manufacturers will be required to pay tax rates that are as high as 11.90%. Seventeen municipalities have municipal tax rates on major industry that exceed 5 percent and in 48, or nearly one-third of all BC municipalities, the total property tax rate on major industry exceeds this amount. This is a tax rate that will preclude many investments.¹⁸

British Columbia manufacturers believe that the provincial Government should take action to provide a consistent set of taxation standards across the province that will bring greater fairness and equity to the municipal taxation process and avoid extremely high tax rates and ratios while retaining local discretion in tax rate setting. Both municipal discretion and a favourable business climate are desirable objectives, but the current arrangements have not achieved a proper balance between the two in a significant number of BC municipalities. This failure has the potential to adversely affect the business investment climate throughout the province.

- **The present provincial sales tax system continues to impact negatively on many manufacturers.**

The BC Government decision in 2001 to eliminate the provincial sales tax (PST) on machinery and equipment purchases has helped reduce production costs for BC manufacturers and partially offset the competitive cost disadvantage manufacturers have with neighbouring provincial and state jurisdictions.

Unfortunately, the provincial sales tax is not a value added tax, so B.C businesses continue to pay taxes on raw materials inputs used in the production process. This means that manufacturers who use large quantities of energy and other commodities are presently facing rapidly rising international commodity prices AND paying a surcharge of 7% on these continuously escalating prices. This raises government revenues, but makes BC manufacturers less competitive internationally and is certainly a contributing factor to the recent reductions in the value of BC exports.

¹⁷ Property Taxes on Business and Industrial Property in British Columbia Robert L. Bish, Ph.D., Fraser Institute, September, 2004, pg.11

¹⁸ Ibid, pg. 2.

BC manufacturers are also concerned about a legislative anomaly in the Social Services Tax Act which allows BC firms to receive a tax exemption when they purchase production equipment for their production processes, but can not obtain a similar tax exemption for materials used to make the same piece of production equipment in-house. In effect, this anomaly encourages BC manufacturers to purchase machinery and equipment elsewhere rather than manufacturing it at home, thereby exporting the employment and income benefits to other jurisdictions.

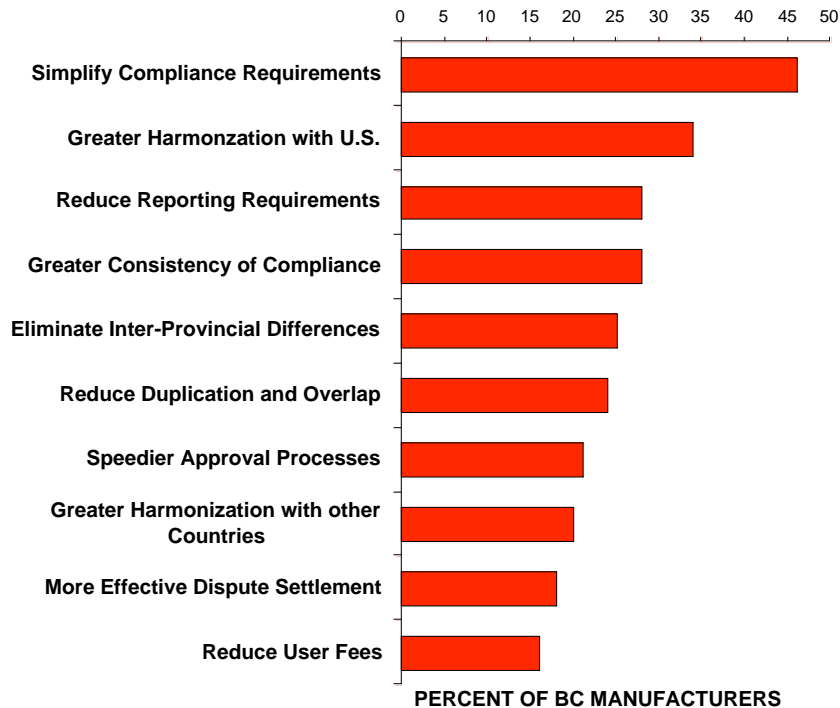
For example, if a BC Company chooses to buy a \$6 million piece of production equipment outside the province rather than build it locally, the BC Government would exempt the non-BC equipment from tax and lose \$420,000 in tax revenue. As well, the economy would lose 25-30 jobs, \$2-\$3 million in wages and salaries, several hundred thousand dollars in government tax revenues and millions in total economic activity. Alternatively, if the BC Government revised the present law to exempt the PST on the materials used by the BC Company to construct the production equipment in-house, it loses the PST on the components, but gains the BC jobs, the BC wages, the increased BC economic activity and the BC tax revenue. In fact, by revising the law, the Government can earn overall positive net tax revenues.

BC manufacturers support the recent government decision to review the provincial sales tax system and believe that the BC Government should use this time to develop a means to move away from a narrowly based sales tax system to a more broadly based value added tax system patterned after the federal government system in order to encourage greater investment by business, while ensuring a relatively neutral impact on taxation.

Regulatory Challenges

In the 2004 Management Issues Survey, BC manufacturers outlined a number of reform priorities that are outlined in the Chart below. BC manufacturers believe that a renewed focus by Governments on the top five items will do significantly more to assist them to meet their global supply chain needs than concentrating on efforts to reduce the overall numbers of regulations within the Government.

Regulatory Reform Priorities 2005



- **Simplifying compliance requirements and improving awareness is critical to dealing with regulatory issues.**

Some 86.1% of all manufacturers in BC have fewer than 20 employees and more than half of all manufacturers have fewer than five employees. In many cases, these BC manufacturers are unaware of regulatory changes or lack an understanding of the range of rules and procedures that exist across the wide variety of programs. In many cases these firms also do not have the internal corporate infrastructure or the financial capacity to meet the rising array of regulatory demands being placed on them from the three dozen agencies and government organizations that regulate the province. Of particular concern to these small firms is the rising number of regulations being imposed on cross border movement of goods, which is making it more difficult for them to get their products to market and contributing to slower growth in exports.

In a recent Leger Marketing survey for FedEx, some three quarters of respondents experienced delays in getting goods across the Canada/US Border and more than 50% of them had recurring problems with documentation completeness associated with the lack of awareness of the new US and Canada trade rules and an inability of manufacturers to properly and accurately complete the myriad forms required for processing.¹⁹ BC manufacturers need Governments to find ways to streamline their regulatory systems and to reduce the regulatory burden on manufacturers. Streamlining the rules will reduce costs for BC manufacturers, but will also reduce costs for governments on both sides of the border when they enforce the rules.

- **Streamlining of the regulatory processes is needed to improve cash flow without impacting on effectiveness**

¹⁹ National Post, "Exporters Cause Own Woes: Study", September 29, 2005 pg. FP6

BC manufacturers frequently face outdated regulations that constrain investment and business development. For example, biotechnology development is a new cluster for BC, but their success is tied to drug approvals which are much slower in Canada than elsewhere. The Center for Medicine's Research International indicates that Canada's review times lag behind the US, Switzerland and the EU. The approval delay, relative to the US market, ranges from six months to two years.

There are also inconsistent, overlapping, duplicative, and often contradictory regulatory requirements and interpretations within and across local, provincial and federal government departments. Overlap and duplication imposes costs that are completely unnecessary or can impose significant additional costs with limited benefits. Land use in B.C., for example, involves more than a dozen federal and provincial organizations, along with a wide range of municipalities, regional districts and First Nations, depending upon where you live in the province and efforts need to be made to ensure that these competing interests are accommodated within a simplified regulatory system rather than being operated independently.

BC manufacturers see the recent BC Community Charter as potentially impacting negatively upon their businesses. Today British Columbia has the most empowering local government legislative framework of any province in Canada and manufacturers are concerned that local governments may use their new powers to control zoning, noise and transportation corridors in a fashion that placates vocal special interest groups while imposing significant costs upon business and without corresponding benefits to the economy.

As an illustration of this point, some Lower Mainland communities are seeking to restrict the hours of operation of truck traffic along main municipal highways, which will have significant negative impacts on BC manufacturers who must ship their products in off hour periods to meet the just-in-time requirements of their customers. Such rules would also impact negatively on the operations of facilities such as the Port of Vancouver and the Vancouver Airport Authority who are trying to expand operations to 24/7/365 in order to utilize their infrastructure more productively. It is vital that regulatory reform be ongoing and that it focus on minimizing costs, while maximizing the benefits of regulatory programs.

BC manufacturers are equally concerned about the increasing use of regulatory barriers by the US authorities to impede trade with the United States, home to 85% of BC manufacturing exports. In particular, BC manufacturers are finding that the cost of cross border compliance related to anti-terrorism measures are skyrocketing without any appreciable reduction in the actual or perceived risk of terrorism attacks.

BC manufacturers indicated that it is equally important to reduce reporting requirements and have greater consistency of compliance. Over time, governments tend to add regulations as the need arises rather than reviewing the entire regulatory process to find better and more effective ways to achieve the same result at lower cost. BC manufacturers believe that there needs to be a concerted and ongoing approach to regulatory reform as an essential ingredient for continuous improvement in overall economic performance. Simply reducing the numbers of regulations is not as effective as ensuring that the overall regulatory system can meet its obligations in an efficient and cost effective manner.

This is particularly challenging at the Canada/US border where up to 50% of the province's manufactured goods head south along Interstate highway I-5 to the prime U.S. markets. BC manufacturers now face new rules for advance notice, reporting, documentation, product packaging and supply chain management that are unprecedented in their detail and in many respects are not linked to appropriate risk management. Individual manufacturers report that infrastructure costs for meeting these new rules can range from \$25,000 to \$250,000 per facility, while the cross border delays are estimated to cost the BC economy more than \$500 million per year.

The cumulative effect of the implementation of these initiatives is a 'layering' of security requirements at the Canada-U.S. border that has increased processing times and imposed significant economic costs, especially on the 77% of exporters who are small and medium sized enterprises. For example, BC manufacturers decry the fact that the Canada and US Governments can not integrate their various security programs like the US Customs Trade Partnership Against Terrorism (CT-PAT) versus the Canadian Partners in Protection (PIP) or the Nexus Land program versus the Nexus Air and Can-Pass Air systems. The Coalition for Secure and Trade Efficient Borders estimates processing times for shipments entering the U.S. have increased 300 per cent between 2001 and 2004, from 45 seconds to over two minutes and 15 seconds per truck. The economic costs to the Canadian and US economies have reached a combined \$13.6 billion per year.²⁰

These requirements are putting BC firms at a serious competitive disadvantage from a customs clearance and security perspective in comparison to its overseas competition. It is time to shift the focus from imposing new regulations to finding better ways through process improvements to streamline the processing systems so the goals of protecting America and securing the external Canada-U.S. perimeter are achieved, while also achieving the goal of a seamless Canada-U.S. border for known low-security-risk goods and people.

- **Reducing reporting requirements is vital for business survival.**

While government efforts to utilize the internet to help streamline data exchange is a useful goal, BC manufacturers are small and medium sized businesses without the financial resources to either internally implement or hire professional service providers to provide the variety of electronic data interchange systems needed to meet the new trade and operating requirements. As well, most manufacturers don't have the time or understanding to keep abreast of the rapidly evolving regulatory environments that are occurring within the trade area, which is illustrated by the fact that 62% of firms entering the US were making mistakes in their export documentation and 75% of them were unaware of the rules governing Canada/US trade.²¹ Significant efforts need to be made to better inform manufacturers about the requirements, to reduce and streamline the reporting requirements and to enhance the ability of firms to respond to the changing trade environment.

- **Divergent standards and regulatory requirements with other markets, especially the United States, are creating significant impediments to business growth.**

Varying inter-provincial rules governing accreditation and training reduces the availability of skilled labour in the province and constrains the ability of manufacturers to expand their operations. As the world becomes more integrated, these types of divergent standards must be eliminated in order to facilitate the efficient management of a global supply chain. In today's world, few manufacturers build 100% of their products themselves, so artificial inter-provincial trade barriers, from divergent education and accreditation standards to varying regulatory compliance rules, actually work against BC manufacturers rather than protect them. Almost 30% of BC manufacturers would like to see the inter-provincial barriers to labour mobility eliminated and greater efforts made toward harmonization of the rules throughout North America.

While there is considerable commonality between Canadian and US regulations, manufacturers in several sectors are seeing an increasing trend toward regulatory divergence between the two countries that will complicate design, engineering and manufacturing operations within the province. Regulatory disharmony between BC and neighbouring jurisdictions significantly increases their business costs, enhances risk and makes them less competitive. This is especially true in the U.S. market place where 85% of BC's manufactured goods are destined.

²⁰ Ontario Chamber of Commerce "Cost of Border Delays to the U.S. Economy", May, 2005, pg. 16

²¹ National Post, "Exporters Cause Own Woes: Study", October 4, 2005, pg. FP6

Outlined below are some examples of divergent regulations facing manufacturers in the transportation equipment, bio-pharmaceutical products, beverage and agri-food processing areas.

Examples of Divergent Regulations in Manufacturing

Issue	Canadian Approach	U.S. Approach
Antiperspirant deodorant	Aluminium content requires a Drug Identification Number (DIN)	No DIN required.
Trans fat on nutrition labels	To be considered “trans-fat free” a product must be below 0.2 gram of trans fatty acids (i) per reference amount and serving of stated size or (ii) per servicing of stated size if the food is a pre-packaged meal	In order to be considered “trans-fat free” a product must have less than 0.5 gram per reference amount and serving size
Fortification of breakfast cereals and other food products	Canadian regulations specify which foods may be fortified and the levels for their fortification with vitamins and minerals	The U.S. has no limits on the levels of vitamins and minerals.
Fortified water	Addition of vitamins and minerals to bottled water is prohibited	Bottled water may be fortified with vitamins and minerals.
Frozen pizza	BHA, BHT and caramel colour are approved additives but cannot be used in pepperoni and sausage chunks	BHA, BHT and caramel colour are permitted for use in pepperoni and sausage chunks.
Cheese-flavoured popcorn	Cheese seasoning must be less than 49% real cheese.	53% real cheese seasoning used.
Auto anti-theft immobilizers	Proposed requirement for immobilizers accepting Canadian and European Standards	An option for U.S. high-theft line vehicles.

BC manufacturers believe that greater efforts need to be made to improve harmonization between BC and its major markets, with a priority for improving harmonization within the North American market place. BC manufacturers also reported that they would like the BC Government to become more proactive in working toward this harmonization in concert with the federal government.

- **User fees and administrative penalties applied by governments that are not necessarily tied to improvements in either regulatory or business performance.**

In many areas, manufacturers are facing rapid increases in user fees for services without seeing a direct beneficial relationship to the cost of delivery or efficiency. In some cases these fees or charges stifle innovation by focusing business on meeting regulatory demands rather than customer needs and impose costs that make many businesses uncompetitive in the global market place.

The container trucking dispute in July 2005 is a case in point. BC manufacturers, who are price takers and must operate in international competitive open trade oriented economy, are now confronted with significant transportation cost increases for moving container traffic into and out of the Ports of Vancouver and the Fraser River. These costs are not matched by any corresponding assurances or mechanisms to ensure that the drivers are operating in the most cost effective manner or will do so in the future. In fact, there is every indication that the recent rate based system negotiated between the parties sets a floor price that protects the profits of the least efficient operators. In turn, the transportation price increases will make BC

exports uncompetitive internationally and may make it difficult for BC manufacturers to remain globally competitive.

Because BC manufacturers operate in a small open economy, it is vital that governments at all levels ensure that they impose user costs selectively and with due regard for the costs they impose on business. The federal government recently enacted Bill C-161 which imposes requirements on federal departments to justify user fee increases to a Commons Committee before being implemented. BC manufacturers would like to see similar legislation implemented at all levels of government.

Goals

Due to the new economic realities, BC manufacturers must compete with firms around the world and in order to compete successfully they need to have taxation and regulatory systems that are competitive with their major trading partners.

British Columbia must become the preferred location in North America for businesses to locate, invest, manufacture, export from, employ and grow.

Recommendations for Action

In order to become “best-in-class” Government needs to...

- Ensure that the Canada and BC tax systems provide the most favourable treatment for manufacturing investments amongst the G7 by 2015. Manufacturers believe the governments should endeavour to get the combined federal and provincial tax rates on corporate income reduced to no more than 25% and BC's average marginal effective tax rate on manufacturing investments should be reduced to 17%.
- Federal and provincial governments should provide accelerated capital cost allowances to allow BC manufacturers to acquire new technology and an investment tax credit for the purchase of advanced manufacturing technologies. BC firms should have the right to fully depreciate their manufacturing and processing equipment over two years.
- Implement a value added BC consumption tax system to eliminate distortions in the taxation program that negatively impact the business community. B.C. manufacturers believe that it is essential for the B.C. Government to establish a more broadly based sales tax system that is similar to the Federal value added tax program. While the Government studies the situation, they should implement an interim regime by broadening the range of PST tax exemptions for manufacturers to include raw material inputs and equipment and production systems built domestically for manufacturing production.
- Find new ways to finance municipal governments and services in order to reduce local government dependence on asset-based taxes on industry, thereby making BC manufacturers more competitive with their competitors in Alberta and Washington State. As an immediate step, the two levels of government should agree on a new set of municipal taxation limits for manufacturers. BC manufacturers would like to see a consistent rate ratio across BC of no more than 3 to 1 (business to home owner).

On regulations, in order to become “best-in-class” Government needs to...

- Establish a formal long-term commitment to continuously improve the regulatory system in BC. with a view to becoming the most efficient and effectively regulated region amongst the G7 by 2020. The BC Government needs to become a leader in the application of continuous improvement or “lean thinking” as it applies to regulation. “Lean thinking” pioneered through the Toyota auto production systems, provides a model for implementing the principle of continuous and concerted regulatory reform and establishing goals and principles against which the regulatory environment can be measured. Successful examples of lean thinking have been applied to a wide range of processes within governments and can be applied to regulation.

Manufacturers believe a concerted effort to implement “lean regulation” in all facets of regulation and amongst all levels of government would help make the province one of the best regulated and most competitive places to live and work.

- Enter into a formal agreement with the federal and municipal governments that commits them to eliminating regulatory overlap and duplication within the three levels of government. Establish a mechanism for co-ordination and the establishment of common standards for the smart regulation of business across the province.

BC manufacturers believe that the provincial Government must place emphasis on establishing legislation and establishing agreements between the BC and municipal governments that would eliminate duplication and overlap in existing programs and prevent new systems to be created within BC municipalities.

Governments have discussed the possibilities for eliminating overlap and duplication, but BC manufacturers believe the BC Government should go the next step by agreeing on a tri-partite program that works to eliminate overlap and duplication over the next decade in BC. BC manufacturers believe Land Use should be the area of highest priority for tri-partite action.

- Provide tax incentives and technical support to BC exporters to allow them to offset the additional costs of compliance with US non tariff barriers related to the US anti-terrorism actions.

The new counter terrorism measures are imposing significant costs upon manufacturers, especially the large majority that are small and medium sized enterprises. The BC Government needs to ally with business to lobby Ottawa and the US Government to establish a North American security perimeter and eliminate the need for internal controls. In the interim, the BC Government needs to provide financial support to BC business to allow them to address these new non-tariff barriers, including tax credits for equipment purchased to meet the US security requirements and an “education/awareness” program to train BC exporters on how to more efficiently and effectively meet the new rules.

On taxation, in order to become “best-in-class” Manufacturers need to...

- Commit to increasing their investments in new technology and expanding their application of innovation to their products. It is acknowledged that manufacturers need to invest more in new technology and with the right tax incentives they would be able to make those investments.
- Conduct research to demonstrate the economic value of a restructured tax system and present concrete proposals to the BC Government by July, 2006 on new taxation programs for the federal and provincial governments. Government needs to have objective information on the nature of the proposed tax changes and the financial implications. Manufacturers are willing to fund the required research.

- Collaborate with Government to promote the positive business environment in BC to their corporate headquarters and to other business organizations that may be interested in investing in the province. Manufacturers are willing to collaborate with Government to promote trade and investment to British Columbia. Corporate executives in other sectors, such as mining, energy, agriculture and forestry have been involved in trade and investment promotion for some time, but there is presently no mechanism within the B.C. Government to allow them to participate. If the B.C. Government establishes a mechanism for that to be done, then the B.C. manufacturing community should participate.

On regulation, in order to become “best-in-class” Manufacturers need to...

- Provide training and advice to Government officials on how the principles of “Lean Thinking” can be applied to regulatory reform. Many business organizations, including groups like Teleflex Energy Canada and Captin, the Toyota auto-plant, and Columbia Plastics along with trade associations like Canadian Manufacturers & Exporters are leaders in implementing the principles of “Lean Thinking”. These groups are well positioned to help train Government officials on the tools and techniques of lean thinking so it can be applied to the regulatory systems.
- Participate, as appropriate, in efforts by Government to reduce regulatory overlap and duplication. Many business organizations in BC have operations around the world and have staff with significant expertise in comparing compliance costs and in suggesting ways for Government to improve process efficiency that will help to streamline regulatory programs. Business needs to provide some of these resources to assist Government to implement their programs.
- Collaborate with Government to share information about US border compliance requirements and develop and implement training programs, seminars and workshops that will educate BC firms on minimizing compliance costs. BC firms need assistance of Government to eliminate compliance costs but until a new North American perimeter system is in place, BC firms need help to minimize compliance costs. BC business organizations have personnel and “alliance partners” that can be mobilized to provide greater awareness if resources are found to cover the “public good” elements of these programs.
- Collaborate with the Coalition on Border Security and Trade Efficiency to support research on ways to streamline the cross border regulatory systems and to lobby with both federal governments to eliminate rules and regulations that impede trade without impacting on security risk. The private sector has taken the lead in developing a cross border action plan, but it needs additional support in order to conduct the research needed to confirm the high compliance costs for BC manufacturers and to increase awareness amongst Canadian and US leaders as to the benefits of developing a “lean” system in cross border trade that increases trade flows without impacting on security.

Infrastructure

The province's transportation, telecommunications, and energy infrastructure must be revitalized to resume its role as a major driver of business investment and economic growth.

BC's transportation system has opened a gateway for BC manufacturers to the world, through which they have delivered over \$600 billion in goods over the past 25 years and imported more than twice that amount for consumption in BC and other parts of North America. BC's modern telecommunications systems and competitively priced energy are also major contributors to economic prosperity. Their ability to succeed has been enhanced by the superb infrastructure base built over the past fifty years.

In the future, BC manufacturers will need to continue to have a world-class transportation and logistics infrastructure system that allows them to effectively manage their global supply chains, thereby maximizing trade opportunities, minimizing input costs, and remaining competitively priced.

Not surprisingly, the 2004 Management Issues Survey found that BC manufacturers believe that improving transportation infrastructure (road, rail, airports, border crossings and ports) within the province is one of the top public policy priorities in the province.

Opportunities

The 21st century is now the century of Asia, with trade between North America and Asia increasing exponentially. British Columbia's physical ports, air and land infrastructure, along with its strong logistics and trade services are key assets in creating this global gateway and to strengthening not only the provincial economy, but the national economy as well. An efficient and effective infrastructure not only supports BC manufacturers, but provides businesses across Canada with the ability to take full advantage of the opportunities being offered by Asian growth.

BC's rail, air and marine systems are now an integral part of the entire supply chain for business across the continent and future growth within the continent will be dependent upon a modern and competitive infrastructure. BC's unique position allows it to promote its "strategic security" to customers domestically and internationally and provides BC with a competitive advantage over competing centres along the West Coast that are much more vulnerable to security breaches or where the risk of disaster in the event of an attack is much greater.

Opening up the skies to more international competition and greater access through alternative ports such as the Port of Prince Rupert will provide major opportunities for manufacturers to access markets and to locate their business operations. The new Prince Rupert container port has the potential to transform trade by opening new opportunities for manufacturers across the country to take advantage of low cost backhaul container rates from North America to Asia and establishing inland Free Zones and various distribution portals in less congested areas, such as Prince George and Kamloops.

BC's location on the west coast of North America provides a strategic opportunity to create a world wide logistics hub within the province on par with Singapore or Hong Kong. This logistics hub would provide a multi-modal gateway to North America from both Asia and Europe and can provide significant opportunities for cluster growth amongst firms that supply transportation services, information technology, trade finance and global supply chain management functions.

Challenges

Manufacturers in BC have always placed a heavy emphasis on well-developed infrastructure. Up until the mid-1990s, manufacturers viewed the quality of the province's transportation, communication, and utilities infrastructure as a significant competitive advantage for their business. Conditions have changed over the past ten years.

- **Infrastructure impediments are placing greater strains on BC manufacturers' ability to efficiently obtain inputs and get their products to market.**

In order to take proper advantage of their global supply chain, BC manufacturers must have unimpeded traffic flow into and out of - and throughout - the province in order to efficiently fabricate, assemble and distribute products.

Unfortunately, there is insufficient infrastructure in this province to meet present day transportation demands. In the 2004 Management Issues Survey, BC manufacturers reported that infrastructure impediments and rising energy costs are resulting in higher production costs, lower profits and negative impacts on the ability of manufacturers to compete and survive.

Roadways feeding into and out of major urban centres are increasingly clogged with passenger cars and trucks, slowing traffic. Highways leading to and from crucial border crossings with the United States cannot handle current traffic volumes in a time-efficient way. Labour disputes, local noise and transportation bans along with various other policies are increasing the cost and length of time required for manufacturers within the province to obtain inputs or distribute their products and making it both more expensive and more risky to meet just-in-time delivery schedules.

West Coast port facilities cannot guarantee that they can offer adequate or reliable services to meet the requirements of manufacturers increasingly dependent on export or import shipments. Air services are curtailed due to controlled air access to global markets. And rising energy demand is straining the energy grid across the province.

Recent reports including "Opening Up BC: A Transportation Plan for British Columbia, BC Ports: Competitive Profile and "Transportation as An Economic Growth Engine",²² discuss these transportation constraints in some detail so there is little point in repeating the long list of infrastructure challenges. For BC manufacturers, the immediate problem is finding mechanisms to immediately cope with the existing congestion and logistics dysfunction in the province while efforts are underway to find longer term solutions. Moreover, BC manufacturers need to be certain that governments are working to solve not simply the physical infrastructure constraints, but are simultaneously working to address the human resource, information and trade services constraints that exist within the current system.

BC manufacturers need to have an efficient transportation network and the ability to move freely throughout the province in order to maintain competitiveness. To build British Columbia as "the Pacific Gateway" will require greater co-ordination and collaboration by the various levels of government and the private sector to ensure future success.

- **BC manufacturers need to modify their business practices to adjust to the new world of 24/7 operations.**

²² B.C. Ministry of Transportation "Opening Up BC: A Transportation Plan for British Columbia, Victoria, B.C., June, 2003; Colledge Transportation Consulting Inc. "British Columbia Ports:Competitive Profile, Victoria, B.C., Ministry of Small Business and Economic Development, June, 2004 and Goldberg, Dr. Michael A. "Tranportation as an Economic Growth Enginge", Vancouver, B.C., B.C. Progress Board, December, 2004 Insert reference on three studies.

BC manufacturers can contribute to efficient movement of goods throughout the region, but the reality is that most manufacturers contribute to the problem by not having flexible work schedules themselves. The majority of B.C. manufacturers operate on a standard eight hour day, while expecting transportation companies to move goods on a 24/7/365 basis to maximize efficiency.

BC manufacturers and their employees need to recognize that they may need to move to a more integrated system that links their work schedules and operations more closely with the transportation sector in order to improve the flow of goods throughout the various transportation corridors within the province.

- **Demands for heightened security at the borders pose significant threats to trade and global commerce in BC.**

Some 26% of BC manufacturers are now reporting that Cross Border infrastructure issues are getting worse rather than better and the recent Ontario Chamber of Commerce study has documented the significant business costs being incurred to meet US and Canadian security concerns. These costs are the result of regulatory problems, but also constraints within the physical and knowledge infrastructure linking the two countries. The infrastructure constraints are costing the BC economy hundreds of thousands of dollars per day in lost business and with more than \$38 million in advanced manufacturing products heading from BC into the US each day, the risks of serious economic damage is very high and rising.

While Governments are working to improve physical access to the U.S./Canada border, BC manufacturers today continue to face significant delays in getting their goods into the United States. This translates into lower revenues for both Government and business. There is a pressing need for substantial investments in leading edge information and monitoring technology to make it easier for business to comply with the new rules.

Most importantly, there needs to be even greater efforts made to integrate the operations of the various regulatory organizations on both sides of the border and enhance communications between them. Improving, integrating and streamlining administrative processes or the knowledge infrastructure will enhance trade, reduce waste and increase the flow of existing business across the border. As well, governments and business must work together to provide “education and awareness” programs to educate businesses about the new rules and to assist them to meet high standards of documentation accuracy and completeness.

- **BC manufacturers must have access to appropriate supplies of industrial land located strategically throughout the various regions of the province.**

Today manufacturers need access to land that can accommodate their needs for flexible manufacturing systems that consume large quantities of goods and services obtained from a wide variety of suppliers, many of whom need to be located in close proximity to those facilities. Most manufacturing facilities use state-of-the-art production systems and with just-in-time operations they have less inventory and fewer warehousing requirements, so demand less space.

Unfortunately, municipalities often move industrial land to the outer limits of a community, which often de-links the suppliers from the manufacturers and creates negative impacts upon communities, such as population displacement, increased inter-regional transportation costs, increased consumption of energy and infrastructure, reduced environmental quality and a lower quality of life. To illustrate this challenge, a manufacturing operation located in Annacis Island can – within 30 km - access all its required transportation services by rail, water and road, along with a wide spectrum of skilled personnel from a variety of income classes, a full range of suppliers and service providers and can reach all its principal markets. If changing government policies forced that same facility to relocate into the Fraser Valley the business would likely have fewer transportation alternatives, longer travel distances, smaller local labour markets and less variety and number of supply and service firms within a similar 30 km radius.

Not only are firms being pushed to the outer limits of communities, many communities across the province face a supply shortage of good industrial land. In the Lower Mainland only 2.1% of the total of 3.2 million square feet of industrial land is presently available for use and only Surrey has access to sufficient quantity of raw land to satisfy their industrial needs for the next twenty years.²³ In particular, industrial land in and around B.C. marine ports is scarce. Similar situations are occurring in Victoria and Kelowna and other communities around the province.

Not only is there less available industrial land, but municipal governments are converting existing industrial areas to commercial and residential uses. Government needs to protect and hold vital industrial lands to meet the growing demands of our ports and transportation systems.

These actions by municipal governments are placing intense pressure on manufacturers - forcing them further away from key transportation corridors and main population centers. This in turn is placing increased pressure on transportation systems, adding to the costs for manufacturing businesses to transport material inputs and to distribute finished products to markets and increasing environmental degradation.

Unfortunately, manufacturers have contributed to the problem by not engaging with municipal politicians and bureaucrats to explain the new realities of the global supply management system and to educate officials on the new paradigm for manufacturing. As a result, municipal governments are often unaware of the economic dislocation they are creating and its negative impacts on business costs. Manufacturers need to be more proactive in educating governments about the modern realities of manufacturing and providing reasonable solutions to fully incorporate manufacturing back into the regional economies.

With appropriate integration with their suppliers, modern manufacturers have the opportunity to substantially increase growth and productivity, while having a reduced impact on the municipal environment. Granville Island provides a daily reminder of how industrial, residential and commercial land can be combined to create an integrated and lively community that is dynamic yet sustainable. Significant opportunities exist to replicate this model throughout the province.

Goal:

Business and government alike need develop an efficient infrastructure system that will allow the province to become and remain “the Pacific Gateway” for trade, travel and commerce in North America. The goal is

“To create a transportation network and logistics hub in British Columbia that is a benchmark for efficiency and excellence amongst the G7.”

In order to achieve this goal, manufacturers, other shippers, transportation and logistics companies, along with all levels of government must work together to ensure that future shipping needs are met on a just-in-time basis and at competitive costs. The BC Government already has in its hands the strategic planning tools it needs to move forward with these investments. If Governments implement a comprehensive transportation strategy that deals with both the physical infrastructure constraint and addresses the human resource, information and trade services constraints that exist within the system, the province will be strategically positioned to

²³ The data comes from Colliers International – 2nd Quarter, 2005. Colliers data differs from data from CB Richard Ellis reports (fourth quarter, 2004) at 145.2 million sq. ft. and an overall vacancy rate of 2.6%, while Royal LePage Commercial notes a total inventory (second quarter, 2005) of 161.9 million sq. ft. and a vacancy rate of 2.44%. Colliers International is the primary source of data due to the timeliness of its reporting, the fact that its figure for total supply represents a middle ground between the higher and lower estimates of Royal LePage and CBRE, and the comprehensive nature of its quarterly report.

become a true global logistics hub on par with Singapore, Hong Kong and Rotterdam by the end of 2020.

Recommendations for Action

While BC manufacturers support the implementation of a set of wide ranging transportation measures, it will take a decade or more to install this new infrastructure. In the interim, BC manufacturers believe that Government can make a significant and more immediate impact on opening up their global supply chains and key markets.

In order to be “best-in-class” Government needs to...

- **Give higher priority to the movement of goods on BC’s transportation network.**

Many nations give higher priority to the movement of goods over private vehicles in their transportation networks in order to ensure that economic growth is protected. The BC Governments should follow suit. If goods movement was granted priority on the air, road and marine systems, it would enhance the province’s global supply chain capabilities, while reducing costs.

In the short term government should

- Make changes to allow existing high occupancy vehicle lanes throughout B.C. to be used as express lanes for truck traffic at all times of the day. This would ease goods movement and improve inter-modal logistics.
- Establish Douglas Crossing as an exclusive truck crossing location at certain key points. This would facilitate faster movement of goods into the US.
- Quickly establish a “short-sea” ferry system along the Fraser River. This would provide an alternative means to move goods and reduce road congestion.
- Make greater use of intelligent transportation systems (ITS), transportation demand management (TDM), and transportation supply management (TSM) with a view to providing greater incentives for goods movement and reducing commuter traffic.
- Reduce fuel and insurance premium taxes for the transportation industry. This will allow transportation firms to remain viable and ensure manufacturers’ goods get to market.

- **Continue to give high priority to the establishment of the Northwest Corridor as a major transportation corridor for trade with Asia.**

Asia will be major trade destination and the northern rail route from Prince Rupert through Western Canada to Chicago will create a major national transportation corridor for the fast and efficient transportation of goods to and from the North American market place. This corridor has tremendous opportunity to expand the manufacturing base of BC and to accelerate the effectiveness of the global supply chain management of thousands of manufacturers across Canada. Government should work with manufacturers to find ways to utilize the shipping advantages of the Asia destined “back haul” to sell higher value added goods into the Asian market.

- **Develop true "open skies" for the Vancouver International Airport Authority, and negotiate fifth freedom and cargo continuation rights with all origin and destination countries with or without reciprocity, including China, India, Singapore, the European Union, and the United States.**

An effective air network is vital to the efficient flow of goods across the globe and BC manufacturers believe that a more competitive air network will facilitate growth.

- **Ensure sufficient industrial land is available in all BC communities to allow manufacturers to continue to operate efficiently and maintain their global supply chain.** Governments need to recognize the need to have an ample supply of industrial land available throughout the province. A balanced approach to land allocation and zoning will actually reduce transportation costs, travel time and environmental degradation.
- **Create “Ports Land Reserves” to protect Ports and adjacent lands for future generations from other commercial and non-commercial uses.** There is an urgent need for more industrial land around B.C.’s ports in order to provide the manufacturing, transportation and logistics capabilities to handle expanded Asian trade. Governments need to develop a land reserve policy for industrial land in order to ensure that there is sufficient capacity to meet expanding manufacturing demand.

In order to be “best-in-class” manufacturers need to....

- **Organize their operations to provide greater utilization of the transportation systems in off peak hours including revisions of work schedules and operating procedures.**

More BC manufacturers need to re-align their work schedules to extend operating hours for receipt and shipment of goods in order to co-ordinate more closely with the movement to 24/7/365 within marine and air cargo operations. Transportation entities such as the Port of Vancouver can not be asked to move to a continuous operating mode if manufacturers do not adjust their operations to accommodate this new reality.

- **Accept the need for the use of intelligent transportation systems (ITS), transportation demand management (TDM), and transportation supply management (TSM) as a means of improving the transportation networks.**

BC manufacturers need to be made more aware of the financial impact that traffic congestion has on their business and to recognize that tools such as peak pricing, tolls and load shifting measures will lead to higher per unit transportation costs in the short term, but over time will lead to lower overall costs due to the improved ease of goods movement.

BC manufacturers must embrace the use of new computerized data exchange and other process improvement tools in order to improve their efficiency in moving goods and to aggressively participate in programs set up to facilitate trade between Canada and the US such as NEXUS, NEXUS-Air, CT-PAT, PIPs and FAST.

- **Collaborate with Government on providing education and awareness training to manufacturers on the rules and regulations regarding cross border documentation and improvements to document accuracy.**

Manufacturers need to be more proactive in educating businesses about the new rules because an ill informed business person actually contributes to higher costs by diverting enforcement resources to the less efficient operators and adding to costs associated with moving across the border.

- **Become more active in educating municipal and provincial officials on the benefits of integrating industrial land into a more comprehensive land use program.**

International business development.

B.C businesses need the capacity to operate on a global scale

BC manufacturers are expanding their operations around the world as well, not only in terms of direct investments and business expansion, but also through joint ventures and business partnerships. The United States, European Union, China, Mexico, Japan, and Australia/New Zealand are the countries in which BC companies are most actively involved.

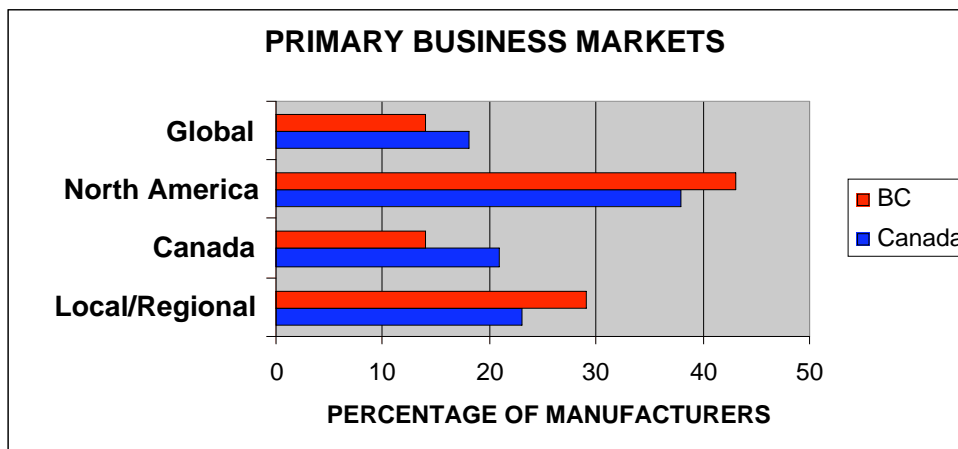
However, the challenges, the opportunities, and the changes in international markets and the nature of global business activity, are forcing B.C. firms to revise their basic assumptions about the drivers of business success and develop new ways of thinking about manufacturing and global enterprise.

Challenges

BC manufacturers face a number of constraints in expanding sales into international markets. Their constraints are related to the internal capacity of companies to develop products and services, expand production capabilities, develop distribution, sales, and marketing channels, and obtain the financing they require for export development.

- **BC businesses don't operate in the global market place.**

While BC firms do market around the world, their primary business markets are focussed on the West Coast of North America from BC to Baha, rather than on regional or global markets. Only 14% of manufacturing companies indicated in the 2004 Management Issues Survey that they have a global focus in marketing their products or services. And BC manufacturers who do access global markets tend to do so through U.S. distribution systems rather than selling directly to international markets. BC firms are much less likely than Canadian firms to sell to other parts of Canada and they are less likely to go global. Both history and transportation networks contribute to this tendency.



BC firms need to become more globally focussed in order to expand their business activities and to diversify their markets. The present dependency on marketing to the Western United States must be reduced and new markets need to be developed. For BC manufacturers, Mexico, China

and the European Union are the three principal areas where they feel they could successfully exploit opportunities.

- **B.C. manufacturers face rising costs to sell globally.**

Manufacturers struggle to manage rising costs as they endeavour to expand markets. The cost and availability of insurance – particularly product liability insurance for companies exporting to the United States – is an issue often raised by manufacturers across BC. Insurance costs have risen steeply since 2001 and many companies report that they are unable to obtain insurance coverage if they export to the United States.

BC manufacturers now depend on international markets for more than 55% of their total operating revenue so managing exchange rate risk is another challenge. Most BC exporters price their exports in U.S. dollars so the recent appreciation of the Canadian dollar has been like a 30% price cut on export sales over a period of two years. It has had a significant negative impact on profit margins, cash flow, and competitiveness. Smaller firms in particular have noted that it is difficult and costly to develop financial and operational hedging strategies, diversify export markets, or restructure supply chains in order to offset the costs of rapid appreciation and the volatility of the dollar.

It takes money, time, expertise, and a great deal of effort and internal resources for any company to develop and sustain export sales in foreign markets – even in markets as close by as the United States. Many BC manufacturers cite costs and the lack of adequate internal resources, expertise, and personnel as constraints on their export development activities. Again these are challenges reported primarily by smaller companies rather than mid-sized or large enterprises.

Companies of all sizes acknowledge that business planning and corporate organization are both significant factors in determining export readiness. Smaller companies are also more likely to cite product development, difficulties in providing customer service, and production scale-up constraints as challenges in export development. BC manufacturers report difficulties in finding partners, distributors, and sales agents for entry into new markets. They cite difficulties in identifying market opportunities in other countries. They also report that they face various export constraints and non tariff barriers in international markets, including import tariffs, import quotas, regulatory restrictions, variable regulatory requirements, differences in product standards, government subsidies, corruption and foreign investments restrictions affecting employment, local business partners, technology transfer, and investment quotas.²⁴

- **BC manufacturers identify Canada-America business relationship problems as having the potential to seriously impact on future growth and profitability.**

Since most BC advanced manufacturers look to the US as their primary market, it is not surprising that BC manufacturers identify a number of immediate problems and concerns regarding Canadian-American business relationships that must be rectified in order to strengthen bilateral trade and investment. Companies participating in CME's *Manufacturing 20/20* discussions in 2005 were most concerned about border delays, increasing U.S. protectionism, regulatory changes, rules of origin and cross border credentialing for staff transfers.

Goal:
To make British Columbia a globally focussed economy that is dominated by world class companies.

²⁴ BC manufacturers' external constraints depend upon the markets they enter and the amount of activity they have within those markets. More BC companies, for instance, market into the United States and they tend to identify export constraints in the United States more often than in any other market.

Recommended Actions:

In order to become “best-in-class” Government needs to...

- **Ensure that the core of any Global market strategy is the need to improve access for Canadian and BC businesses in the U.S. market.**

At the heart of its North American strategy, governments need to co-ordinate their efforts and adopt a “preventative maintenance” approach to potential trade disputes. Border delays must be eliminated, and trade disputes rapidly resolved, making the Canada-U.S. border seamless for commerce between the two countries. Perimeter-based security and inspection systems must be rapidly deployed, infrastructure constraints eliminated and efficient systems installed for the movement of goods between the two countries. There must be greater harmonization of regulatory compliance requirements between the two countries, a strengthened NAFTA dispute settlement mechanism and improved North American tax treaties that will eliminate withholding taxes on interest, dividends, and royalties on the continent.

- **Ensure that governments and businesses have a China strategy**

Governments and business need a co-ordinated and integrated approach to respond to the economic challenges and take advantage of the business opportunities posed by China and other rapidly emerging economies like those of India, Russia, and Brazil. The parties must focus their attention on the elements needed to create enterprises with a global focus— on process improvements, supply chains, business networks and systems integration in which all aspects of commercial activity take place concurrently in a number of countries around the world – and on what is necessary to capture the highest economic benefits of that activity for British Columbians. Governments need to promote the diversification of trading and investment relationships, provide incentives to businesses to open new markets, and assist businesses to operate on a global scale.

Our trade agreements must ensure that Canadian industrial and services companies can enjoy more secure and open access into major global markets. Greater emphasis must be placed on bilateral, regional, and multilateral trade agreements with respect to investment, services, regulatory harmonization, intellectual property protection, competition and procurement policies, as well as industrial tariff issues.

In addition, there must be greater coordination and alignment across all government departments in matters affecting international competitiveness and international business development – including foreign affairs, trade, and international development assistance policies, as well as policies related to the environment, innovation, agriculture, health, natural resource management, immigration, business and consumer law, tax, and regulation.

- **Strengthen international trade and investment promotion in British Columbia**

BC manufacturers and exporters recognize the importance of trade and investment promotion services offered by Canadian government agencies, the provincial government, financial and business services companies, and business associations. They especially note the important role played at the federal level by the Trade Commissioner Service, Export Development Canada, the Canadian Commercial Corporation, the export assistance programs offered by regional development agencies, and Team Canada trade missions. However, they believe that it is vital for the all levels of Government provide the integrated solutions that BC businesses require.

BC manufacturers want to see more co-ordination and integration among all agencies involved in trade and investment assistance activities in the province, and greater involvement of and

investment by the provincial government in supporting businesses as they endeavour to address imperfect market conditions around the world. Serious consideration should be given to creating a single trade and investment promotion entity that is funded by all levels of government and the private sector and is led by business, in order to clearly focus global market strategies on the needs of the business community, most of whom are manufacturers.

Governments should also collaborate more with business associations and other private sector organizations in their trade and investment promotion activities abroad, in supporting business consortia aimed at expanding international business, and in building mentorship programs for companies entering new markets.

In order to become “best-in-class” Manufacturers need to...

- Develop the capacity to operate on a global scale. B.C. manufacturers need to take a more outward looking focus to their marketing and to take action to become more globally competitive. B.C. firms need to diversify their markets within the United States and to seek out more opportunities on the Pacific Rim and in Eastern Europe. B.C. manufacturers should consider developing collaborative trade partnerships or consortia to cost share efforts to enter and sustain a presence in new markets.
- Engage in developing a China strategy. Every B.C. firm needs a China Strategy, either to protect against foreign competition or to define and exploit market opportunities. Too few B.C. manufacturers have a China Strategy and all firms should actively develop initiatives to allow themselves to compete effectively against these emerging nations.
- Support Government efforts at trade and investment promotion. B.C. manufacturers need to collaborate with Governments to help them to identify new market opportunities and to assist manufacturers to exploit those opportunities. B.C. firms need to register with the Virtual Trade Commissioner service and to use the services of the federal and provincial governments when they look for trade abroad.

Business and financial services.

The changing financial and servicing requirements of manufacturing must be met in a cost effective way.

In order to become and remain globally competitive, B.C. advanced manufacturers will need to have access to the best services in the world, including the range of business and financial services needed allow them to be competitive. As BC advanced manufacturers expand their use of the global supply chain systems, they will need to collaborate more with service providers, including financial service providers, to ensure alignment along these supply chains. Greater coordination is required across the services sector to develop integrated logistics, supply chain, distribution, financing and information management solutions. Smaller companies in particular need customized solutions – and that will require the services industry to adopt lean business practices and mass customization strategies of their own.

Manufacturers must work with financial services providers to educate them about the changing processes and risks involved in modern manufacturing. More integrated financial solutions are necessary to meet the growth requirements of manufacturers and businesses operating in markets around the world. Additional sources of debt and equity capital need to be developed. Solutions must be found that provide cost-competitive insurance services for manufacturers, especially with respect to product liability insurance for exporters to the United States.

For B.C. manufacturers today, financing is not a critical factor or a “top of mind” issue. Only 18% of manufacturers in the 2004 Management Issues Survey cited financing as constraint on performance improvement and only 14% considered it a constraint to bringing new products to market. Furthermore, only 6% of BC manufacturers indicated that the availability of export financing poses a constraint on their export development activities, but larger companies appear to have more problems than smaller firms in obtaining adequate export coverage. As BC manufacturers expand their business horizons and become more globally focussed, it is certain that financing and business service issues will become increasingly important.

Challenges

- **Short term strategic horizons and the squeeze in profits are constraining the ability of firms to innovate.**

The dramatically shorter product cycles and the rapid pace of change in today's market place is shortening the strategic planning horizon and forcing a need for constant investment in innovation in order to compete. The challenge for B.C. manufacturers is to find ways to stimulate internal cash flow, because almost two thirds (62%) of firms depend on cash flow rather than debt or equity to finance innovation. Moreover, as cash flow pressures from increasing prices, the rising Canadian dollar and other factors deplete internal operating resources, it also becomes harder for firms to get more external financing.

For manufacturers, expanding venture capital and other external financing sources will have less impact than improving their bottom line profits.

- **Manufacturers are not taking advantage of programs that do improve their cash flow.**

Programs like the federal Scientific Research & Experimental Development (SR&ED) tax credits provide external financing through cash-flow improvements to manufacturers and thereby increase the opportunity to lever external financing. However, the 2004 Management issues survey showed that more than 60% of companies don't use the program, mostly because they are unaware of its benefits (19%), it is too costly to apply (20%) or it doesn't apply to their type of commercialization or innovation (48%). As well, delays in processing SR&ED tax credits and other government payments tend to aggravate cash flow management problems, further impeding the ability of firms to effectively access additional financing.

More BC manufacturers need to take advantage of SR&ED tax credits and the credit program needs to be expanded in order to encompass productivity improvements.

- **Bank policies can impede moves to improve productivity and increase sales**

Throughout the consultation process on Manufacturing 20/20, BC manufacturers across the province outlined several banking policies that they felt impede their ability to obtain external financing. These were:

- β Bank lending policies often penalize companies for reducing inventories and other collateral as part of the process of Lean improvement, even though the outcome of such initiatives is likely to be improved cash flow and healthier profit margins;
- β Bank policies are generally set nationally and often restrict the lending authority of local branches, particularly outside of urban centres. There is widespread concern that loan approval decisions are being taken with little knowledge of local business conditions or capabilities.
- β Bank policies tend to favour extension of trade credit to the United States, but make it more difficult to obtain comparable credit for sales made to offshore regions. Moreover,

- banks often do not have knowledgeable personnel available locally to properly evaluate the market potential.
- β Manufacturers often find difficulties in accessing credit for the activities of integrated supply chains and business networks, particularly when those networks extend into other countries;
 - β A lack of local financing options apart from bank credit; and
 - β High administrative costs that make smaller financial transactions less appealing (like the cost of obtaining letters of credit for small orders);
- **Limited understanding of the requirements for financing, particularly on the part of smaller companies, and a lack of intermediaries between smaller manufacturers and financial institutions.** Many BC manufacturers aren't aware of what they need to obtain external financing, especially for trade activities outside of North America and how to approach financial institutions to obtain that funding. As well, there are few intermediaries and other groups to provide assistance and support to firms seeking to expand their trade opportunities.
 - **A lack of buy-out capital in BC which makes it difficult for BC manufacturers to compete with foreign companies in acquiring innovative technology businesses.**

Goals

To ensure BC advanced manufacturers have the array of financing tools necessary to maximize their investment in innovation and business expansion.

Recommendations for Action

In order to become “best-in-class” Government needs to...

- Provide financial support to B.C. manufacturers to encourage them to undertake lean process improvements which will free up company resources (equipment, materials, plant space, people, cash) and increase firms' ability to finance innovation without the need for significant external financing. Such actions provide government with a positive return on investment, since US experience with the Manufacturing Extension Program demonstrated that every \$1 invested by Government in lean enterprise programs has resulted in \$22 in additional economic activity and \$7 in new tax revenues.
- Provide incentives to encourage the creation of larger pools of buy-out capital and to develop innovative and more customized financing mechanisms for manufacturers and exporters.
- Streamline the SR&ED tax credit program to allow firms the opportunity to reduce their cash flow requirements and increase their investments in innovation.

In order to become “best-in-class” Manufacturers need to...

- Implement lean methods and other efficiency enhancing improvements to strengthen cash flow and internal innovation and capital expansion budgets. By actively engaging in continuous process improvements, B.C. manufacturers will increase their efficiency and effectiveness, reduce waste and increase cash flow. This in turn will provide greater ability on their part to invest in innovation and technology and become world class companies.
- Improve their management skills and awareness of financing requirements. B.C. manufacturers need to become more actively aware of financing requirements if they want to compete globally.

Part 4: A Call to Action

BC manufacturers are competing in a global marketplace where the pace of doing business is red hot, the competition is intense, the name of the game is adding value, and where innovation is the key to success. BC's manufacturing sector continues to drive the provincial economy and there are numerous business success stories, but BC's manufacturing sector has been falling behind. A performance gap has opened up between world-class practice and the average performance of our firms. In 2004, the best in class amongst B.C.'s G7 competitors was the United States who rated a score of 79% on all five benchmarks, while B.C. was stuck at a lacklustre 54%.

BC manufacturing is determined to eliminate this performance gap and to make British Columbia a global benchmark for industrial performance. This is a vision of far-reaching change. It is one of significant challenge. However, it is a vision we must embrace if we wish to sustain and strengthen the wealth creating capacity of the British Columbia economy, the vitality of communities across the province and the living standards of all our citizens.

Today manufacturers are doing much more than define a vision. They are promoting the need for a coherent and integrated approach to managing change. Responding to the future challenges of the global marketplace will demand new strategies, and new ways must be found to get things done. Manufacturers have affirmed the need for more action rather than more words. They have underlined the urgency of situation, because they are at the forefront of the competition and the change that will transform the economy over the next ten to fifteen years.

Manufacturers understand that governments at all levels have a vital role to play in determining our future, but they also understand that they too must do their part. That is why they believe that they need to take the lead in defining their future, set stretch goals, and establish benchmarks for progress in achieving the critical factors that will ensure their business success.

In this report, manufacturers have outlined a range of recommendations on the range of factors – from leadership, to workforce capabilities, through innovation and infrastructure and on to taxation and the business environment – involving the active engagement of everyone, because we all have a stake in the future of manufacturing in this country.

The challenge for British Columbians is to not just to live in the best place in the world, but to live in the best and most prosperous place in the world. Our economic prosperity will, in turn, depend on our ability to grow the high-value, high-paying activities that are part of the modern business of manufacturing in this province.

Our Vision 2020

B.C. manufacturers are acknowledged as “best in class” amongst the G7 and the key driver in making our province the most prosperous region in the Americas.

In order to achieve that goal, Governments at all levels and manufacturers, along with academia, labour, employees and other stakeholders must identify what is within their power to change, focus clearly on priorities for action, and then follow through by implementing solutions, working together to get the job done.

Manufacturers across BC have affirmed the need for more action rather than more words. They have underlined the urgency of situation, because they are at the forefront of the competition and the change that will transform the economy over the next ten to fifteen years.

BC manufacturers have outlined a range of actions that need to be taken by Government and manufacturers in order to move forward to achieving the Manufacturing Vision. The top priorities for Action are:

A. Leadership and the image of manufacturing

“To close the excellence gap, business strategies, public policies and programs, must be coordinated and aligned”

Given the emergence of a more integrated global economy, B.C. will face enormous economic adjustments over the next ten to fifteen years that will be even more challenging and far-reaching than those we have experienced this generation. The pace of change and growth will need to be faster than our competitors, if B.C. if it is to eliminate the gap and achieve its potential.

Leadership is fundamental to responding to the challenges and the opportunities that face industry. Manufacturers believe it is vital that BC create a “2020 Vision” for BC and that business strategies, public policies and programs be developed, coordinated and aligned to build a prosperous provincial economy. Better communication, co-ordination and collaboration are essential to global excellence. The lack of close interaction between business, government, labour and academia is a huge impediment to innovation and to fostering a true innovation and knowledge-based culture in BC.

BC needs an independent leadership forum to guide the vision and to provide the independent analysis and thinking needed to support achievement of our goal by 2020.

In order to become “best-in-class” Government needs to...

- Acknowledge the importance of creating a shared globally competitive industrial vision for BC by establishing a non partisan independent organization to lead its development. Once developed the organization should be mandated to provide strategies for achieving the vision within the context of a continuously changing global competitiveness landscape. Governments need to participate in and financially support this organization.

In order to become “best-in-class” Manufacturers and the other industry sectors need to commit to...

- Lead the independent organization, to help fund the organization and to work with governments and other stakeholders at all levels to build the Vision and make it a success.

B. Workforce Capabilities/Skills Development

“The province’s workforce must be ready and able to meet the future requirements of manufacturing.”

Available and qualified personnel are critical to BC’s efforts to expand its innovation activities (82%), fundamental to meet changing business practices (64%) and a significant factor in their firm’s location decisions (32%). BC manufacturers need more workers with the basic skills required for the job, more with business skills and more with practical experience.

BC manufacturers invest about 2.4% of payroll in formal skills training – or approximately one-fifth of the amount invested in Japanese manufacturing and three-quarters of that invested in the U.S. Careers in manufacturing must be viewed as attractive opportunities for young people. Manufacturers must be able to find people with the mix of specialized skills they require and employees must possess the skills required to work in innovative, highly flexible, and internationally networked business environments. Ways need to be found through tax and other incentives to encourage manufacturers to invest more in continually upgrading the skills and capabilities of their workforce and for their workforce to be encouraged to continuously upgrade their skills. The province's workforce must be ready and able to meet the future requirements of manufacturing. And, more must be done to encourage manufacturers to collaborate in skills training and pool resources to access expert personnel who have the opportunity to continually upgrade their skills and capabilities.

Manufacturers and governments need to strengthen collaborative efforts in skills training, expand their apprenticeship training and develop more effective labour/employment relations practices to encourage retention and expansion. And there needs to be an improved immigration system to more effectively attract new Canadians and improvements to collaborative efforts between government and business to encourage more immigration.

One component of closing the gap on labour productivity and unit labour costs...

In order to become “best-in-class” Manufacturers need to...

- Increase investments in skills upgrading to help eliminate the performance gap. The initial target should be to double their investment in formal and informal skills training from 2.4% of payroll or \$200 million annually to 5% of payroll or \$400 million annually by 2010.

In order to become “best-in-class” Government needs to...

- Provide tax incentives to encourage manufacturers to implement firm specific training and to encourage workers to take skills related training. Tax incentives have been used successfully in Ontario, eighteen U.S. states and many European nations to stimulate training investments.

C.Innovation

“British Columbia manufacturers will be G7 leaders in all aspects of innovation, including flexibility and continuous improvement.”

Innovation is key to success in global markets. BC manufacturers need to at least double the pace of their innovation and investment in R&D. They need to strengthen their ability to undertake commercialization needed to bring new and improved products and services to market. They need to be able to spread the value of technology more quickly across firms. Technological diffusion is critical. BC manufacturers feel the need to increase the speed at which they adopt new technology in order to increase productivity and improve provincial prosperity and certain tax incentives like accelerated depreciation allowances can give industry that boost

B.C. manufacturers need to move more quickly to implement continuous improvement in all aspects of their business and production systems in order to improve efficiency and reduce costs. Governments need to support and encourage these efforts at continuous improvement because they drive productivity and prosperity.

B.C. firms also need a well-developed innovation infrastructure to improve their business and production processes and the cash-flow needed to make the required investments. Governments need to support and encourage these investments because they drive productivity and prosperity.

Public support for innovation must be driven more by market opportunities for commercial application and less by research agendas or the goal of pushing technology into the marketplace.

In order to become “best-in-class” Manufacturers need to...

- Significantly increase their R&D investment across the province. The initial target should be to increase investment to \$750 million by 2010 and to \$1 billion by 2015.
- Significantly enhance their investment in technology and engage in a widespread adoption of the principles of continuous improvement (Lean Thinking) across all sub-sectors. The initial target should be to match the growth of emerging nations (12.1%) by 2010 and to become the benchmark leader by 2020.
- Measure innovation and provide annual updates on progress made with respect to the benchmarks of success of BC manufacturers against their G7 competitors.

In order to become “best-in-class” Government needs to...

- Provide tax incentives similar to SR&ED credits that extend support for innovation to product commercialization and process improvements. These incentives should complement existing tax incentive systems for innovation and be administratively efficient.
- Provide accelerated depreciation allowances through the entire “system of production” to allow firms to continuously upgrade their technology, remain flexible and successfully compete.

D. Competitive Business Environment

“British Columbia must become the preferred location in North America for businesses to locate, invest, manufacture, export from, employ, and grow.”

BC manufacturers operate in a global market place that requires them to become and remain internationally competitive. To operate successfully where resources flow to the most competitive jurisdictions, government needs to provide a benchmark tax regime and an effective and efficient regulatory system. Government must provide tax regimes that are competitive with the world's best jurisdictions if manufacturers are to make the contribution they can to the BC economy. This is particularly true for small and medium enterprises that often face tougher challenges in operating in a global marketplace.

The BC Government's efforts at creating a competitive tax environment are encouraging and 76% of BC manufacturers feel more optimistic about the BC business climate as a result. However, many countries continue to provide better tax treatment than BC for those investments made by industry and many regions are providing lucrative financial incentives to draw manufacturers. BC still ranks fourth in Canada and 16th amongst its main competitors in taxes, so further efforts are needed. In particular, BC manufacturers need to increase the speed at which they adopt new technology in order to increase productivity and improve provincial prosperity and certain tax incentives like accelerated depreciation allowances can give industry that boost.

Municipal taxation is punishing manufacturers in many BC communities and is negatively impacting on the ability of firms to invest in new plant and equipment. The provincial sales tax system continues to impact negatively on many manufacturers and reform is urgently required. Reform in municipal taxation is an urgent need as local tax rates are punishing manufacturers in many BC communities and are negatively impacting on the ability of firms to invest in new plant and equipment. As well, the provincial sales tax system continues to impact negatively on many manufacturers and reform is required.

The BC Government's present commitment to regulatory reform has been well received by the BC manufacturing community, but greater effort is needed. BC manufacturers want to see a formal and ongoing commitment to the principles of continuous improvement. They want an ongoing "lean regulation" system that simplifies compliance requirements, reduces regulatory duplication and overlap, increases regulatory harmonization - especially with the US, reduces reporting requirements and increases the speed of approvals processes. B.C. manufacturers need greater awareness of the rules and regulations governing cross border trade and greater effort needs to be made to make North America a seamless distribution system.

British Columbia is the Pacific Gateway to North America, but to reach its full potential Governments need to increase their investments in the Gateway and ensure that the entire global supply chain works seamlessly in both directions.

In order to become "best-in-class" Manufacturers need to...

- Fund independent research that provides objective analysis of how the tax and regulatory environment impacts on their sector and provide annual updates on progress made with respect to the benchmarks of success of BC manufacturers and their principal competitors. Special consideration will be given to tracking municipal taxation on business throughout the province.
- Provide annual municipal taxation benchmark reports on municipal taxation related to business.

In order to become "best-in-class" Government needs to...

- Ensure the marginal effective tax rate on manufacturing investments in BC is among the best two provinces in Canada by 2007 and the most competitive of the G7 nations by 2015.
- Commit to making regulatory reform a top five priority and commit to B.C. becoming the most efficient and effectively regulated region amongst the G7 by 2020. The target should be to completely reform the Provincial Sales Tax and Municipal taxation systems by 2008 and to reform land tenure by 2010.
- Ensure BC is acknowledged by the G7 as having an efficient and effective infrastructure system by 2020.
- Support the efforts of manufacturers in order to make B.C. the biggest investment destination amongst the G7 by 2015.

APPENDIX 1

Global Trends In Manufacturing

Global market trends, new technologies, increasing competitive pressures, and new customer expectations will continue to transform manufacturing into the virtual value networks that will dominate global business in the 21st century. It is impossible to foresee all the changes that will characterize manufacturing in the future, but many trends are already apparent and technological capabilities already exist. Here are some of the trends that manufacturers from across Canada believe will be fundamental to the future of the industry.

Global Integration

Manufacturers will restructure their operations, production systems, and supply chains to serve global customers. They will continue to move where the money is – to the rapidly expanding markets of emerging economies. But, production and services will become more integrated worldwide to take advantage of the best in terms of skills, technologies, and cost structures, allowing companies to boost their profit margins while offering customers higher value at lower price. E-business technologies will allow manufacturers to connect anywhere at anytime with customers around the world. And, the world of manufacturing itself will be characterized by global operations, global competition, and competing global supply chains. We are already well on the way there.

Knowledge Capture

The real value created in the business of manufacturing will reside less in production processes – which will become more and more highly automated – and more in those knowledge-intensive activities associated with product research and development, design, modification, and service. For manufacturers, the money will be made in knowledge capture. It will depend on their ability to control intellectual property, anticipate customer requirements, and design innovative solutions to meet their needs.

Mass Customization

Manufacturers will continue to compete on delivering customer value at lower and lower costs. That will require individual products to be designed and manufactured for individual customers to meet individual needs. Competitive advantage will be determined by production to individual specifications. But, competitive cost structures will have to be put in place in order to ensure that customization is commercially viable. The ultimate goal will be the competitive batch of one.

Mass customization will entail businesses tailoring product functionality, design, and service to satisfy individual customer requirements, but making differentiated products at high speed and in high volumes in order to keep unit costs to a minimum. Manufacturers will have to accelerate flexibility through continuous innovation and shorter production runs that can accommodate changing and more specialized customer requirements together with shorter product life cycles.

Mass customization will require further changes within the business of manufacturing:

- Information systems that can quickly identify customer specifications, turn them into work orders, and create pull systems throughout supply chains and production processes, that meet both customer demands and manufacturing requirements;
- Agile production facilities that can rapidly be reconfigured to produce different products or product variations with minimal changeover time;
- Standard product platforms and easily interchangeable and compatible product parts;
- Process-based quality control and certification systems;
- Individualized tracking and materials management systems;
- Lean, just-in-time supply chains;

- Low-cost logistics infrastructure; and,
- Customer services that cover the life cycle of products, from design through to financing, after-sales service, and disposal.

Manufacturing as Service

The business of manufacturing is driving toward providing complete customer service over the entire life cycle of products. As production systems become more flexible and more highly automated, differentiation and value creation will depend increasingly upon services. Manufacturers will aim to solve their customers' problems, and become important elements in their customers' success. They will do so by offering a complete service package – including research and development, design and engineering, testing and quality assurance, financing, maintenance, delivery logistics, after-sales service, upgrades, and ultimately product disposal. No company will be able to provide all of the services needed by customers. However, service providers will be integrated with companies that make things in international value networks, supply chains, and virtual enterprises.

Value Chains

Manufacturers, their customers, and their suppliers together form value chains that compete against other value chains for sales to final consumers. Today, manufacturing depends on the efficient management of supply chains and business networks. The extended enterprises of the future will be virtual enterprises in which business units around the world will continuously reconfigure their operations and supply chain relationships, forming and reforming networks on a project-by-project basis. They will rely on networked information systems and virtual engineering to ensure concurrent design, production, marketing, service, and sales support. They will operate as if their member firms were all units of a single continuously reconfigurable enterprise, regardless of their geographic location. And, when successful, they will all be aligned to provide solutions for the ultimate customer.

Knowledge Supply Chains

Manufacturing will be an even more knowledge-intensive business in the future. Its focus on delivering full service solutions to customers will require a highly educated, highly flexible, and highly skilled workforce in order to create, produce, manage, and deliver the innovative and differentiated products, processes, and services that future customers will demand.

Manufacturers' value chains will really be customers' knowledge supply chains. The concept says a lot about how knowledge will be commercialized, how innovation will have to be managed, as well as about the importance of education and skills at every stage of the process.

- Business success will depend on aligning knowledge to meet customer needs;
- Customer requirements will pull knowledge into commercial applications;
- Knowledge, skills, and technologies will be sourced from around the world;
- More individualized customer needs will require products and people to service them. Quality of service will be based primarily on communication and design – the ability to translate personal preferences into technical specifications on the one hand and manufacturing and service capabilities into simple, saleable solutions on the other;
- Next generation production systems will rely on new technologies and highly automated production processes – requiring skilled technicians and managers to make things work;
- Highly flexible, reconfigurable enterprises and production processes will demand continuous learning, problem-solving, teaming, effective communication, and creativity on the part of all employees;
- Product and process innovations will be based on new technological capabilities and commercializable applications of intellectual property;

- New technologies and intellectual property will in turn require advances in basic scientific, engineering, and mathematical research, while more attention will be focused on the science of manufacturing; and,
- The effective management of innovation and knowledge supply chains will need to be based on a more advanced understanding of cause-and-effect relationships in theories of business management.

Intellectual property, skills, and experience will be key assets for manufacturers in the future. They are today as well.

Virtual Manufacturing

Virtual manufacturing systems will be extremely agile, but they will also be intelligent. They will not only ensure rapid response, but integrate customers within design, testing, and service delivery.

The manufacturing systems of the future will embody the intelligence of advanced software applications and modeling and simulation capabilities. They will be built around integrated systems of human and artificial intelligence – allowing for the specification, communication, and technical translation of exact customer expectations; the application of machine intelligence, expert systems, and neural networks in production; and the design, coordination, and integration of complex production, logistical, and business systems.

Future production systems are being planned on the basis of virtual engineering and virtual factories:

- Computer automated technologies are allowing manufacturers to combine design, engineering, testing, scheduling, production, maintenance, quality assurance, services, and supply chain management into single processes. Manufacturing capabilities will then depend on the efficient management of information and the rapid translation of that information into production systems.
- The “factory” will become an information network. Customers will participate in the design and testing of products in accordance to their specific needs. Their requirements will be communicated to computer-integrated and mobile machining, processing, and material delivery systems. No assembly lines or stationary islands of automation – virtual factories will allow for machines and production cells to automatically reconfigure themselves on the production floor in response to new orders or new product variations. Purchasing and scheduling will take place automatically as orders are received. Machines will be capable of producing a wide variety of products and parts. Fully automated systems will allow for continuous “lights-out” production, and people will be employed to maintain, program, schedule, and plan processes of change. Eventually, shared, flexible, computer-integrated production facilities may be cloned around the world for remote satellite programming to make customized products whenever and wherever they are needed for just-in-time customer delivery. Smart machines will learn when to produce parts and what parts to produce. The virtual factory may itself evolve into the reproducible factory in the future.
- Virtual engineering processes will integrate simulation, modeling, analysis, testing, diagnostic, and analytical technologies in design, production, and control functions affecting all aspects of manufacturing. Virtual reality will play a key role in permitting customer participation in design and engineering. Intelligent equipment, sensors, robotics, and smart materials will help to control quality and process flows. Manufacturers will be able to control, repair, and service their products on-line. Smart engineering systems will increase the degree of flexibility and speed up cycle times significantly. They will integrate and simplify manufacturing processes. And, they will be the key to making customization commercially viable.

New Enabling Technologies

Advances in electronics, information and communication technologies, computing capabilities, software programming, and e-business networks are already revolutionizing the business of manufacturing. They provide the capabilities that make flexible, automated production systems, global supply chains, and global customer reach possible. New applications of information and communication technologies will continue to revolutionize manufacturing activity, including the use of advanced modeling and simulation, artificial intelligence, digital imaging, high density data storage, and virtual reality.

Other advanced technologies will also revolutionize future manufacturing capabilities, including:

- **Biotechnology and genetics.** Manufacturers are already working with bio-materials, creating bio-products, and using bio-processes thanks to advances in the science of genomics.
- **Nano-technology.** Molecular engineering is allowing manufacturers to build things from their most basic atomic structures up.
- **Micro-machining.** Techniques that exist for producing devices and mechanical parts, whose size can be measured in microns, will enable greater precision, sensitivity, and flexibility in micro-production processes.
- **Metrology.** Advanced measurement systems will allow for greater precision in production and process control.
- **Mechatronics.** Systems that integrate sensors, actuators, and control functions in one intelligent system will improve product precision, performance, efficiency, and ease of use.
- **New materials.** The development of new materials from bio-materials and advanced polymers, to light weight composites and super-conductive materials are providing manufacturers with a capacity to develop new and improved products and processes that can get the job done better for customers at much lower costs.
- **Smart Materials.** Smart materials change shape, colour, form, phase, electric and magnetic fields, temperature, optical qualities, and other characteristics in response to external stimuli. Designers will be able to use smart materials to set new standards in meeting customer needs, as well as simplify products, add features, reduce material use, and lower the expense of product specialization. Future smart materials will be capable of self-diagnosis, repair, and learning.
- **Fuel Cells and Alternative Energy.** Hydrogen fuel cells, solar energy, and nuclear applications will be used in products and processes as alternative energy sources.
- **Integrated technologies.** Future manufacturing capabilities will be expanded even more by the integration of these technologies.

Environmental Sustainability

In the future, manufacturers will be operating in a world of increasingly severe resource and energy constraints. They will also be expected by the public, governments, and other stakeholders to exercise responsibility for the way they interact with the environment. Environmental sustainability will be a critical driver of costs and a key operating principle in product design, engineering, and life-cycle management, the development and use of production and process technologies, as well as in the management of energy and natural resources.

The New Paradigm

The business of manufacturing is being redefined by changes in the market place and how companies react to them. Manufacturing is being transformed from a traditional model of individual companies working with mechanical mass production systems to produce standard products for local markets. Now, companies are operating with flexible and highly automated production systems, producing customized goods and services, and are both part of and dependent on supply chains with global reach. Manufacturing has become "the systematic

process of production," where the focus is on the system rather than on the creation of a specific good.

Manufacturing as a Systematic Process

R&D	Design & Engineering	Commercialization/ Prototype	Supply/ Finance	Production/ Assembly	Marketing, Sales & Distribution	After Sales Service
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_Traditional Definition _

_----- _----- _----- _ -- Modern Definition - _----- _----- _

The new paradigm is changing the face of manufacturing across the country and around the world. As it becomes more prominent, the new system will change the face of manufacturing forever. The elements of this new paradigm are as follows:

Customers & Markets

- Manufacturers are going to where the money is – they are turning from traditional local and regional (North American) markets to serving customers around the world.
- Their growth strategies are being driven by exports and international production capabilities.
- The days of standard production when manufacturers could continually pass costs along to customers through higher prices are over. Manufacturers now have to focus on delivering customer value at the lowest possible cost.
- Manufacturers have to meet the more stringent requirements of customers who are now sourcing globally instead of locally.
- Money is made by meeting new or more specific customer needs rather than by increasing production volumes.

Products

- Manufacturers are moving from standard products to product differentiation in order to escape the effects of commoditization.
- Products are becoming more specialized and more customized to individual requirements.
- The pace of product innovation is accelerating – product life cycles are shrinking.
- Products incorporate a greater degree of technological sophistication.
- Services (design, quality assurance, financing, after-sales services) are now essential elements in adding customer value.

Operations

- Customer-pull systems are replacing production-push manufacturing.
- Production systems are more flexible, allowing them to be reconfigured for shorter production runs.
- Processes are more highly automated, controlled and integrated through advanced information and communication technologies.

- Process efficiency and cost reductions are being driven throughout the business, from materials handling and production processes to information systems and supply chain logistics.
- Lean principles of achieving customer value and eliminating waste are being systematically implemented.
- Inventories are being reduced.
- Time has become the chief metric for making money. Companies are striving to reduce wait times, down times, and the time required for product and process changeovers.
- Greater variability is allowing for greater control over product and production defects through quantitative methods of quality assurance.
- Business strategies for growth must be based on product and process innovations, not simply adding volume.
- Innovation is permeating the organization. It is no longer being performed solely in research and development and engineering departments, but is important on the shop floor, in purchasing and logistics, in marketing and design, as well as in management systems.
- Work is now more flexible and knowledge-intensive. Scientific and technical knowledge is driving product and process innovations. Work requires a much greater degree of technical skills and experience, problem solving, multi-tasking, teaming and collaboration.
- The standardization of materials, components, parts, and services is allowing for greater inter-changeability and an increasing trend to outsourcing from other suppliers.
- Manufacturers are now outsourcing high value goods, services, technologies, and skills from around the world.
- Logistics and supply chain management are crucial elements in delivering customer value at fully competitive costs.
- Accountability is being passed throughout manufacturing organizations for financial reporting, quality assurance, and health, safety, and environmental protection.

Organizations

- Manufacturing has become a business that now extends across supply chains and value networks.
- Production functions and services are being separated organizationally, but integrated through electronic networks and supply chain management.
- Companies are no longer competing on their own strengths. Supply chains are now competing to deliver full value for customers.
- Site-specific manufacturing and supply relationships are being replaced by international supply chains and globally distributed networks.
- Large businesses are expanding their operations around the world but at the same time consolidating investment, research, design, engineering, and other key decision-making functions in one or a few locations.
- Business units throughout the world are competing for investments and product mandates.

As you can see below, the world of manufacturing has radically shifted and will continue to rapidly evolve. Everything has changed and will continue to change and the manufacturing sector needs to adjust with it.

The Implications for Manufacturing in Canada

Canadian manufacturers are restructuring their businesses in response to the challenges they face in the global marketplace. They are not alone. The emergence of new markets and disruptive low-cost competition, the rapid development of new technological capabilities, more demanding customers, a more demanding public, and simple bottom-line pressures are changing the nature of manufacturing everywhere.

The future is one of global customers, global networks, and the potential to source from the best companies, the best technologies, and the best skills from around the world. It will be driven by customer needs and innovation. It will be built on sophisticated technologies with powerful capabilities to revolutionize products, businesses, and production processes. It will require greater and greater degrees of flexibility and precision. And, it will need new knowledge and highly skilled people to make it work.

The key question is what sort of value-adding activity in the world of global manufacturing will remain in Canada, and how much?