

Calgary Manufacturing Productivity Issues and Opportunities Study

April 2009

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Background

Calgary's economy over the past five years has offered all sectors of industry both significant opportunities and challenges. The opportunities that come with record employment, population and GDP growth are seemingly endless, but the challenges that arise, including rising costs and labour shortages, can often overshadow these opportunities. One of the key ways to overcome the challenges is to improve the productivity of Calgary businesses. Productivity improvements can be directly linked to sustainable economic growth and business retention. If properly executed, productivity improvement initiatives can have a positive effect on all sectors of the economy, as well as individual companies. Now with the worldwide economic downturn, remaining productive is as important as ever for businesses who want to remain profitable and succeed in these troubling economic times.

This report focuses on productivity in just one sector – manufacturing. The Province of Alberta, has launched an initiative aimed at educating and providing tools to Alberta's manufacturers to help increase their productivity. It is hoped that by focusing on productivity within the province, business and government revenues will increase, a highly educated and skilled workforce can be developed, companies within the province will continue to be successful in competing in the global marketplace, and the standard of living for all Albertans will be enhanced.

Introduction

Throughout the fall of 2008, Calgary Economic Development spoke to a variety of Calgary manufacturers, across all sub-sectors and of varying firm size, in order to understand where they stand when it comes to productivity initiatives – what productivity means to them, what kind of improvements they have already implemented, what the barriers are to making these improvements work, and what they would like to see provided by industry associations and government partners to become more successful on their productivity journey. It should be noted that this study is a qualitative evaluation of productivity, rather than a macro-economic study about productivity. The questions we asked were subjective in nature and the answers were mostly anecdotal.

Our findings indicate that the majority of Calgary firms have an opportunity to be more productive. With the strong economic growth experienced over the past 3 years in particular, manufacturers priorities have been short-term and focused on keeping products moving and retaining staff. While most recognize the importance of productivity in theory, they are either unwilling or unable to put the theories into practice. For the most part, barriers to productivity are focused

around a lack of awareness, antiquated company culture, lack of investment, and issues around training and labour. That is not to say that there are no good examples of productivity improvements by Calgary manufacturing firms. This paper will examine both the good and the not-so-good, in an effort to understand what manufacturers need in order to prosper in these changing economic times. It should be noted that the content of this paper is a reflection of how manufacturers think government can do more to encourage and support their productivity efforts, rather than what manufacturers themselves can do to advance productivity on their own. Before moving on to the interview findings, it is important to understand the make-up of the manufacturing sector in Calgary.

Manufacturing in Calgary

Over the past decade, Calgary's manufacturing sector has been a strong contributor to Alberta's job market. About one quarter of Alberta's 142,900 manufacturing workers are employed in Calgary – 46,800 manufacturing employees in 2007. Manufacturing represents 7.2 per cent of Calgary's total employment. The sector created 6,100 new jobs from 1997 to 2007. Recent employment growth in the industry has been driven by machinery manufacturing, wood products manufacturing, and primary and fabricated metal manufacturing. Over the past decade the average annual growth of manufacturing employment in Calgary was 1.4 per cent, well outpacing overall flat growth in Canada at 0.2 per cent, but coming just below Alberta's growth which was 1.8 per cent.

As of July 2008, there were 1,743 manufacturing establishments in Calgary, representing just over 3 per cent of Calgary's total business establishments. The majority of firms – 53 per cent – are small employers with less than 10 employees. There are only 123 establishments that employ over 100 people; 26 of these are in machinery manufacturing, 5 of which employ over 500 workers.

Over the past 10 years, manufacturing GDP in Calgary has grown by almost 40 per cent. It is expected to increase another 3.2 per cent by 2012. In 2007, Calgary's manufacturing GDP was close to \$5.4 billion, representing 9.6 per cent of the city's overall GDP. Manufacturers also play an important role in Alberta's export market – in 2007 manufacturing accounted for over \$24 billion of Alberta's exports, which is an increase of 96.5 per cent since 1997.¹ As shown by all of this data, Calgary's manufacturing sector is a dynamic one which produces a variety of consumer and industrial products used by individuals and companies throughout the province and around the world.

¹ It should be noted that export data is not available at the municipal level.

Productivity Overview

In recent years, worldwide increases in energy and commodity prices have generated strong performance in Canada, and Alberta's natural resources sector, masking a growing problem in the rest of the economy. Compared to other developed economies, Canada has very weak productivity growth and sliding real income growth. Despite the record breaking economic growth Alberta has seen over the past 5 years, over the long run, Alberta's productivity growth has been the lowest in Canada. Recent downturns in the global economy, along with the impending retirement of a core group of workers (baby boomers), will place greater demands on the existing workforce and on the economy as a whole. According to the Conference Board of Canada, gains in economic growth after 2010 will have to rely on unprecedented levels of growth in productivity.

Productivity has a relatively simple definition – it measures the efficiency with which resources such as labour or capital are employed in the production process. Productivity improvements can be directly linked to sustainable economic growth and business retention. Productivity growth is a key indicator of the strength of the economy and is directly related to quality of life. Unfortunately, the most recent productivity statistics for Canada are disheartening. In the third quarter of 2008, Canadian productivity remained unchanged, while U.S. firms improved efficiencies by 0.4 per cent in the same period. For the first three quarters of 2008, there has been a widening gap between the two countries – with Canada declining by 1.4 per cent while the US boasted a 3.2 per cent gain. All this means that Canadian GDP and hours worked are increasing in tandem, while Americans are able to produce more, with fewer hours worked.

Canada is thus at a competitive disadvantage because productivity gains turn into lower prices for consumers, better wages for workers, increased business competitiveness and higher tax revenues. As productivity grows, more resources become available for use in areas that Canadians hold as priorities, such as health care or education, and for investments that bring further progress.² Studies have shown that a 1 per cent productivity growth means that living standards will double in 70 years – increase that growth to 3 per cent, and the living standard will double in just 24 years.

The Conference Board of Canada has been studying Canada's poor productivity performance for the past twenty years. What they have found is that there is no single factor that explains the underlying productivity gap, but has found that firms that are the most productive have certain characteristics – they are more capital intensive, have a higher educated and skilled work force, are more open

² Canadian Federation of Independent Business, "Building Business Success: A Survey of SMEs on Productivity," April 2007

to international trade and competition, and are generally larger, than their less productive counterparts.³

Productivity and Manufacturing

Productivity improvements and manufacturing are often spoken of in the same sentence because manufacturers produce something tangible, unlike many other knowledge-based industries, where productivity is a much more abstract concept. Manufacturers have measurable inputs (raw materials and labour) and outputs (finished goods), and how one becomes the other is easily substantiated. Thus the thought is that if the goods are made quicker, with fewer man-hours, less waste, and lower cost, manufacturers are being more productive.

Canada's manufacturing productivity performance since 2000 has been worse than the general business sector performance. Output per hour advanced at only a 0.6 per cent average annual rate between 2000 and 2006, compared to 5.5 per cent per year in the United States. In other words, US manufacturing labour productivity growth has been nearly ten times as fast as that of Canada.⁴ In short, American manufacturing firms are doing more with less.

Once again, Canada (and Alberta) is at a disadvantage because productivity growth also provides an opportunity to move away from low-value commodity manufacturing to more specialized, value-added manufacturing. Value-added manufacturing is more capital-intensive and more technologically complex, leading to products that are more desirable to the export market. Employees are able to generate greater value for each hour worked, allowing for greater competitiveness, along with augmented wages and an increased demand for other goods and services, which in turn provides more employment opportunities in new industries.

It is impossible to talk about manufacturing productivity improvements without using the term "lean" which is really just a euphemism for continuous improvement. By committing to eliminating waste, simplifying procedures and speeding up production a company can become lean. At its base, lean manufacturing is a focus on the reduction of inventory and lead times in an effort to achieve cost efficiency, inventory reduction, shorter cycle times and greater flexibility. As such, lean is often used as shorthand for productivity improvements, and most of the individuals we spoke to used the term when discussing improvements they have made to their business. As described by the Canadian Manufacturers and Exporters, lean principles and techniques are an important way of generating customer value, eliminating waste and systematically improving cash flow performance – it's a vital philosophy given the

³ The Conference Board of Canada, "Sluggish Productivity Growth in Canada: Could the Urbanization Process Be a Factor?" December, 2008

⁴ Donald G. McFetridge, "Innovation and the Productivity Problem," Institute for Research on Public Policy, April 2008

bottom-line pressures manufacturers face on a daily basis.⁵ That said, using the word lean and actually being lean, are two different things.

Calgary Manufacturers and Productivity

The Alberta government is looking to implement a productivity program with a vision is to have “*Alberta recognized as the regional leader in productivity and innovation.*” This program will eventually provide tools and tactics that manufacturers can apply to their own firms in order to be more productive at a company-level. But before this can happen, we need to understand where manufacturers currently stand when it comes to productivity and innovation.

CED completed a series of interviews with local manufacturing firms in an attempt to understand what manufacturers are currently doing, what they need to move forward, and how we can help them to reach their productivity goals. Generally speaking, CED spoke to the CEO, president or production manager of each facility. While questions were prepared to lead the discussion, the content of the interviews was guided by issues being faced by the manufacturers themselves in their day-to-day operations. Throughout all of the conversations, four consistent themes emerged:

- awareness
- company culture
- research and investment
- training and labour

What follows are the details of what the interviews, with examples of how each of these issues either helped or hindered firms’ productivity efforts.

1) Awareness

“We don’t know what we don’t know”

Many companies are not fully aware of what productivity really means, how they can introduce improvements into their operation, and how it can help. One of the first issues is how productivity is measured – several firms weren’t even really sure what they should be assessing. The question “what is productivity” is not always easily answered. Simply stated, productivity is a measure of the efficiency with which inputs are used to create output. Businesses are said to have become more productive, or efficient, when the ratio of output they create to the input they use increases over time.⁶

⁵ Canadian Manufacturers & Exporters, “View from the Top for Future Markets,” 2007-2008 Management Issues Survey

⁶ Canadian Federation of Independent Business, “Building Business Success: A Survey of SMEs on Productivity,” April 2007

Generally speaking, those people we interviewed understood and embraced the concept of productivity, but rarely had business plans or strategies that were driving their operation in a more productive manner. When asked how important they felt productivity improvements to be, common responses were “it’s the most important thing,” or “on a scale of 1 to 10, it’s a 12.” Yet despite these assurances that it was top of mind, very few could point to concrete examples of a process they had introduced, either on the shop floor or in the front office, that was working to improve their productivity. The experience of Calgary manufacturers is reflective of Canadian manufacturers as a whole – in the most recent *CME Management Issues Survey*, only 11 per cent of respondents indicated that lean principles have become standard operating practice.⁷

That doesn’t mean that all Calgary manufacturers are not implementing lean principles – a small sampling of the firms we spoke to were able to point to processes that they have introduced that eliminate waste and create efficiencies. Whether it be through investments in automation, re-organizing production flow, or the simple fact of better ways of identifying inventory, some Calgary firms have improved the way they do business and reaped the rewards. One CEO we spoke to estimated that his revenue margins have increased by 32% over the last two years, and he would still only rank himself as a 6 out of 10 on a productivity scale, acknowledging that productivity improvements are continuous and that he still has far to go.

A majority of the firms we spoke to were ISO certified, meaning that they have a formalized business management system in place that ensures effective monitoring processes and a set of procedures that facilitates quality systems and continual improvement. Some of these companies felt that the steps they had taken to become ISO certified were enough to make them more productive, but it should be noted that while having an ISO qualification is an important step to becoming more efficient, it is not an alternative to a programmed productivity initiative.

“Lean is not mean”

When we asked firms that have implemented lean principles why they thought other companies weren’t doing the same, they were of the belief that other firms were most likely unaware that lean principles were applicable to them. Every company is different and so it is hard to take all lean principles and apply them carte blanche. As previously explained, the majority of Calgary manufacturers are small companies – 80 per cent of them employ less than 100 people. As they are niche manufacturing, they often think that lean principles don’t apply. As custom job shops, many Calgary manufacturers work largely from PO to PO. One CEO we spoke to pointed out that some people may not understand that lean is not mean – that it is not a “one size fits-all” principle that is not adaptable to their smaller organization.

⁷CME, 2007-2008 Management Issues Survey

Lean should be implemented everywhere – not just on the factory floor. Companies that are hesitant to apply it to their manufacturing process can still adopt some of the principles, and focus on operating a lean enterprise rather than just lean manufacturing. By applying lean techniques to customer-facing processes, to schedules, and to overall planning, manufacturers can reduce waste, improve quality and accelerate delivery at every link the value chain. Creating this type of value chain brings manufacturers closer to their customers and increases the speed and efficiency of every step from the purchase order to delivery. One manufacturer we spoke to took great pride in the fact that his business was completely vertically integrated, meaning that it is involved in the majority of steps along the supply chain. This creates efficiencies by reducing transportation costs, securing suppliers and markets and creating an economy of scale. Vertical integration allows them to control every aspect of their product, keeping things simple and efficient, which is a key business strategy and an important tool in becoming as lean as possible.

II) Company Culture

“Productivity is not what you do, it’s how you do it”

A theme that was repeated over and over again in our interviews was that productivity improvements can only thrive in a company that has a culture of innovation, and that this culture of innovation has to be continuous and company-wide; productivity improvements do not occur through one-off projects or through one individuals’ actions. The company’s culture is key to introducing change. The concept of productivity has to be understood by employees across every business unit in the company and championed by senior management in order for a company to be truly successful. That said, many of the CEOs we spoke to had not taken any formal productivity or lean courses and so, despite the recognition that their leadership is an important part of introducing change, they were often uncertain how to “rally the troops.”

In addition to the not knowing how to introduce change, the same companies indicated that inflexibility is a barrier to implementing productivity improvements. Change can be difficult and if certain people within the company are ignorant of the issues and unwilling to embrace improvements, it affects a company’s ability to implement improvements. This is not an uncommon sentiment – in a survey of over 3,000 multi-national manufacturing executives, 40 percent of those interviewed indicated that “resistance to change”, followed closely by a “lack of innovative thinking” at 37 per cent as the main barriers to improving productivity.

⁸ Often the most successful firms are those who give their employees a degree of latitude. Allowing them the opportunity to think about how they work, to change the way they work, and innovate on their own is a key step to becoming more productive.

“We’ve had a degree of success, so why change?”

⁸ TBM Consulting Group, “Lean Drives Productivity Gains and Value Chain Improvements,” November 2007

In speaking to Calgary manufacturers, they often pointed out that those most resistant to change were often middle management. With the degree of success they have had in recent years, not only do they not see any reason to change, some managers are often nervous that productivity improvements will mean that their job will be made redundant. One manufacturer we spoke to said that he knew he had succeeded in introducing change when one hold-out employee finally started adopting some of the productivity improvements that had been championed throughout the organization. Until then, lean was just a program idea, not a way of life at the firm. Another manufacturer highlighted the notion that the key to understanding why productivity improvements are necessary, is that the degree of success has changed. Manufacturing is a global industry, and when everyone else is making changes to compete, companies can no longer rely on past successes to survive - they need to introduce innovations in the way they do business to continue to thrive.

Innovation does not have to be technological in nature, nor does it have to involve formal research and development. In fact, up to 80 per cent of innovation is non-technical. A great deal of innovation is the accumulation of small, unremarkable process improvements that will often reduce the costs and increase profits, but they might not be announced or even countable.⁹ Too often firms think that they are not innovative because they aren't coming up with new patents or making new products. Innovation comes with a different way of looking at something or even just making a slight change to either a final product or how that product gets made.

“It doesn't make a lot of sense to have a group of people thinking about how to work, instead of actually working.”

With rising costs due to labour shortages and the higher dollar, managers have a hard time justifying the establishment of any type of productivity working group to determine how to work better. That said, just because an employee is not actually making a product, doesn't mean that employee isn't working. Thinking about how to make products better, quicker and for less money is just as important as the work itself. In order for companies to remain competitive they shouldn't just say that they make something, but rather that they deliver value to customers through the products they provide.¹⁰ This type of value added manufacturing can make a company, not to mention a city or a province, more competitive.

Work has become far more complex and collaborative than in the past, and quite often creating some sort of community of practice to discuss how a company can take advantage of work changes is necessary. One manufacturer we spoke to indicated that this type of workflow planning has had a huge payoff. While it is something of a soft cost in that it is hard to measure, by doing this sort of human

⁹ McFetridge, April 2008

¹⁰ Daniel F. Muzyka, "Private sector must embrace change to keep Canada competitive," Globe and Mail, July 7th 2008

resource management they were able to identify the most efficient people, and proposed a change in how they worked in an effort to maximize the labour they had. In the end they had fewer labour costs with increased efficiency. Other manufacturers we spoke to were not necessarily adverse to doing this type of work, but were unaware of how to do so.

III) Research and Investment

“Sometimes it is a tough path to get technology accepted.”

As previously mentioned, thanks to the pace of economic growth in Calgary over the past few years, and other external pressures such as a rising dollar, companies have ample justifications for not investing in productivity improvements such as automation or technology. At first glance this makes sense, but it is an opportunity lost. The high dollar reasoning for example, seems valid on the surface – a rising loonie means less Canadian-dollar revenue from exports as well as more expensive up-front material costs. But it does offer opportunity – the purchasing power from a high Canadian dollar could have allowed Canadian firms to invest in new machinery and equipment to boost their productivity and international competitiveness, which has been challenged by emerging low-cost competition this decade.¹¹

Countries with high rates of investment in machinery and equipment also have, on the average, higher productivity growth. Investments are broadly accepted as one of the key drivers of productivity growth. Investments in machinery and equipment, as well as in other types of capital or productive assets, can speed up production and improve processes, therefore increasing productivity. Likewise, investments in staff, such as training, encourage business efficiencies and create a workforce that is able to make better use of the capital stock.

As one manufacturer we spoke to put it, before automation, some tasks were running at a 20 per cent efficiency, but before they took a step back and really examined their productivity, this was an accepted part of their business. By making the decision to invest in automation, their efficiency has increased ten-fold. People are still running the machine, and as such they are not immune to error or slow-downs, but the results have been staggering.

Only a few of the companies we spoke to mentioned taking advantage of the Scientific Research and Experimental Development (SR&ED) program, which is a federal (and now provincial) tax incentive program that encourages Canadian businesses of all sizes, and in all sectors, to conduct research and development. Most were of the belief that they either did not qualify, or that the amount of work needed to be done to access the credits would not be worth the return. That said, most were interested to see how the promised Provincial R&D tax credit (to be introduced in 2009) would be administered, as they felt that a made-in-Alberta solution would be easier to take advantage of and more adaptable to their work.

¹¹ Muzyka, July 7th 2008

This adaptability was an issue that arose again and again in our interviews – both with how best to adapt lean principles to their business, along with how to make sure that they are making the right kind of investments in automation and technology. One manufacturer pointed out that some companies can get “drunk” on how much money they can save with automation, but sometimes automation is not the solution. They compared it to trying to fit a square peg into a round hole – there is the fear that because they are often smaller firms, an “off-the-shelf” technology will not work for them and they will have invested too much money into a project that doesn’t have a high enough return on that investment.

One company we spoke to indicated that they have invested millions every year in machinery to save both time and space – this automation allows them to remove man hours from certain processes. But they caution that there are limits to automation, as equipment is still only as good as the person that uses it. The true value comes from the innovative use of that equipment. If for example, the introduction of automation increases production by 20 per cent, an innovative use of this automation has the potential to increase production by 40 per cent. Thus the investment is not only in machinery, but in the training costs that come with it, which can often be prohibitive. This brings us to our final, and often most important issue affecting productivity, that of training and labour.

IV) Training and Labour Issues

“It’s easier to poach someone else’s employee than to have a development plan of your own.”

The success of Calgary’s economy has brought a variety of challenges, the main one being around the rising cost of labour and the and shrinking pool of qualified workers.

When talking to Calgary manufacturers, they emphasized their struggles when it comes to training their workers. The issue here is twofold – retaining current staff and hiring new ones. Companies that spend time and money on training employees will often end up losing those employees to other companies that don’t spend money on skills training, but offer higher salaries. It is a hard decision for companies to make – either you pay the money up front to attract the talent for the short-term or you hire someone with less experience and make the investment in their long-term growth.

In many ways it is a situation that is unique to the time – in times of low turnover, there is something of an evolution in the job. The longer a worker stays in a role, the better they become at their job and are fully trained in every aspect. With high turnover, manufacturers are usually filling from the bottom up (i.e. filling jobs with less skilled people). This means that the industry becomes “dumb-downed” by lost people because with quick growth, it’s hard to learn by osmosis, and without a formalized training program in process, this is what inevitably happens. In the end, better trained people are more productive. As the labour shortage

continues to exert pressure, the availability of skilled workers will continue to affect a company's bottom line.

“The machine is only as advanced and innovative as the person who operates it.”

As mentioned above, benefits from investing in automation can be limited by the people who work the machines. The labour needed to operate machinery has not disappeared, rather it has evolved. One manufacturer we spoke to invested in a very specialized machine and had a hard time both finding and keeping trained operators for the machine, and as a result it didn't make economic sense to keep it. This exemplifies that the issues around labour are more than just attraction and retention. It's not enough to attract enough people to keep the machinery running – the focus should be on what people do and how they do it, which is a fundamental principle of productivity.

Skilled workers will always be in high demand, but manufacturing firms are not taking an active enough role in addressing the current and looming skills shortages they face by improving the skills of their workforce. According to The Conference Board of Canada's *Learning and Development Outlook 2007*, Canadian manufacturers spend on average \$838 per worker on formal training, learning, and development programs – equivalent to 1.6 per cent of their payroll.¹² The report goes on to indicate that this is slightly below the average for all other sectors of the economy. What is even more revealing is the fact that this amount has not increased in 10 years – in fact, once inflation is accounted for, real expenditures on workplace training and learning activities are actually declining. In a recent survey done by the Canadian Manufacturers and Exporters, the majority of respondents (just over 60%) indicated that their training budgets didn't change in 2007 or 2008, despite the fact that nearly three-quarter of all companies responding to the survey report that skilled labour is either highly important or critically important for their business.¹³

Recommendations

A large part of the conversations we had with manufacturers centred around what they need from industry associations and government partners to become more productive.

The majority were generally in favour of Alberta's traditional approach of government not interfering with business, but the fact that operating costs are continuing to increase, other jurisdictions have introduced subsidies to directly compete with Alberta manufacturers, and attracting and retaining high quality labour is an on-going issue, they feel that government agencies can do more to promote best-practices and introduce policies that support the manufacturing sector as it strives for excellence.

¹² Cited in "Key Economic and Labour Force Issues Facing Canada's Manufacturing Sector," Conference Board of Canada, April 2008

¹³ CME 2007-2008 Management Issues Survey

It should be noted that the recommendations don't necessarily provide a one size fits all solution to the issues affecting manufacturers in Calgary. Rather, when taken together, all of the recommendations provide a sense of direction to steps that will make a concrete difference in meeting the productivity challenges facing Calgary's manufacturing firms.

WORKFORCE DEVELOPMENT

All of the manufacturers we spoke to indicated that their biggest issue was around how to increase the number and level of skilled and knowledgeable people available to work in the manufacturing sector. They feel that the government can do more to help them invest in qualified people which will allow them to then grow their business and remain competitive.

l) Assistance with training

As discussed earlier, a theme that arose again and again in all of our interviews was the issue of training. Some companies couldn't spend as much money as they wanted on training their employees, others were becoming jaded by the fact that they spent so much on training only to have their employees poached by other employers, while others didn't even know where to start when it came to introducing a training program into their operation. Everyone we spoke to was in agreement that better training and education programs and policies are necessary before productivity can be improved.

The majority of those we spoke to were of the belief that there should be either an incentive for employers who invest in training program, or even a penalty for those who do not. For example, Quebec has a decade-old legislation called the "Act to Foster the Development of Manpower Training," also known as the "1 per cent law." Passed in 1995, the law initially required all Quebec employers to invest a minimum of 1 per cent of their total payroll on training. Those failing to do so were expected to contribute an equivalent amount to a public fund that support workplace training in initiatives in the province. In recent years, the legislation was amended to exempt companies with payrolls of less than \$1 million. A 2008 report found that between 1997 and 2002, participation in workplace training in Quebec increased from 21 per cent to 33 per cent – the fastest growth rate in Canada – and that over this time period, Quebec dramatically closed the gap with the average Canadian rates of participation in training. The legislation has also led to a significant structuring effect on how training is planned, organized and supported and has also resulted in the creation of several permanent workforce sector councils which are devoted to decision-making related to workforce training and development.¹⁴

¹⁴ Paul Belanger and Magali Robitaille, "A Portrait of Work-related Learning in Quebec," Canadian Council on Learning, March 4, 2008

Another solution to the training issue that came up more than once was a tax credit program for training. A training tax incentive could allow companies to send more staff on courses, write material for in-house training, or help evaluate the success of any training programs that are introduced. Many of the companies we spoke to are willing to promote training within their facility, but were unsure of how to start and how to measure success. They are willing to put in the time but lack direction, and are of the opinion that this is a role that could be filled by government.

II) Increased funding for apprenticeship programs

Unsurprisingly, many of the manufacturers we spoke to employed apprentices who are being trained through SAIT Polytechnic and other technical schools across the provinces. All of them indicated that there should be more support to increase the number of apprentices being trained for manufacturing jobs. They pointed out that there is a problem on both ends of the apprenticeship journey to accreditation – there is a shortage of funding for the schools that do the formal instruction, as well as a shortage of spaces for the on-the-job training which is provided by the employer. As well, many apprentices get lured away to other jobs before completing their program.

Another issue is a lack of information around trades programs for young people. University is not for everyone, and skilled trades provide an alternative for those students coming out of high school who are looking to have a good job but not interested in university. The manufacturers we spoke to were of the opinion that the government can do more to promote skilled trades as an important, viable and successful career for young people.

Both Ontario and British Columbia have tax credits that are designed to attract people to apprenticeship programs, encourage those enrolled in apprenticeship programs to complete them, and reduce training costs for employers. Similar programs could be introduced in Alberta. Manufacturers are not looking for a handout to help them train their employees, rather they are looking at indirect ways to encourage the interest in manufacturing careers, to reduce their own salary costs, and to promote the long-term growth of skills in the sector.

LOCAL SUPPORT

Many of the companies we spoke to feel that they are not getting enough support from both the municipal and provincial governments. Whether it be through more local purchases, visits from appropriate government agencies, or more collaborative work with local manufacturers, it became apparent that more support is needed from agencies and government divisions that have a stake in the manufacturing sector.

III) Purchase locally

Many of the companies we spoke to have clients across North America and around the world, but pointed out that they do very little business with either the

municipal or provincial governments. The fact that local governments are not doing business with local manufacturers has a variety of repercussions – both economically and environmentally. Local businesses pay taxes in Calgary and Alberta and feel that perhaps the government could show their support for the industry by re-investing in their own community and doing business with local manufacturers. On the environmental side, by buying locally, governments can encourage both lean and green principles by supporting a more integrated supply chain and reducing carbon emissions.

Businesses that we spoke to pointed to jurisdictions such as Quebec which have introduced subsidies to its manufacturing sector to allow them to compete with Alberta firms. It is important to note that the companies we spoke to do not want subsidies from local governments, they just note that because they choose to do business in Alberta, sometimes their costs are higher, and so they can't compete with firms from other jurisdictions who are given more support by their governments, which is seen as an unfair advantage.

IV) Increased focus on journey to lean thinking

As previously mentioned, lean is a concept that has to be company driven – for productivity improvements to really take hold in a manufacturing firm, all employees of the company, from the president to those working on the shop floor, have to buy into the concept. That said, there is still an opportunity for external agencies to provide input into how the lean journey can be achieved.

The Alberta government currently has a service known as the Lean Enterprise Assessment Program which has as an aim to help manufacturers with their productivity and competitiveness. Only a small number of the companies we spoke to had taken advantage of this program, and while they indicated that it was helpful, very few could speak to how this program had changed the way they do business. While they had been provided with some good ideas, how to incorporate these steps into their business plan for the long-term had proven to be a struggle. Additionally, as most Calgary manufacturing firms are owner-owned and operated, they take great pride in the work they are doing and many are reticent to have an external consultant come in, point out their shortcomings and then leave. That said, if they were more aware of the capabilities and deliverables of the program, more firms indicated that they would take advantage of it.

There is more to improving a company's lean principles than just assessing their operations. Many of the people we spoke to were more than willing to move things around their shop floor or introduce new technology to improve processes, but they pointed out that they also require assistance understanding how to be a lean leader. As company president they want to be able to “rally the troops” and inspire more productivity, but were unsure how to “be the change”. Much of the training they currently have is informal and many were willing to enroll in a program or attend a conference that would help them become more effective

lean leaders. Once again, if this could be achieved through an Alberta government program or a tax-credit to offset fees, it could go a long way to ensure a company's journey to lean thinking.

V) Promotion of best practices

Building on the statement “we don't know what we don't know”, many of the people we spoke to indicated that they would be very interested in learning what other companies are doing to become more productive. A forum for the promotion of best practices would allow manufacturers to see how other companies have been successful and also provide an opportunity for those already far along their productivity journey to celebrate their success. Practical examples of improvements by their peers, whether they be large or small, are much more relevant to local manufacturers than theoretical discussions about lean concepts.

As one manufacturer indicated, there is a big difference between process and patents; there is no reason why there can't be an open-door policy when it comes to process improvements, as it will only help the industry and the economy as a whole. Another manufacturer supported this type of information sharing as a way to benchmark where individual firms, and the sector as a whole, are on their way to becoming more productive. For the most part, manufacturers are comparing any changes in productivity to how they have done business in the past, instead of measuring themselves against external entities. As such, they have no way of knowing how they compare to other manufacturers in the city, in the province, or globally.

Generally speaking, when we asked how companies measured productivity, very few responded with a concrete answer such as “real output per hour worked” (i.e. labour productivity) or “real output per unit of combined inputs” (also known as multifactor productivity). Many were confused about how best to measure productivity, as definitions, inputs and methodologies often differ from one sub-sector to the next. If it would be possible to give those companies that have measurable results a forum to showcase their program and answer simple questions such as: what did we expect would happen, what actually happened, why the difference, and what will we do differently next time, it could go a long way to helping other firms take the all important first step to truly introducing productivity improvements into their every-day operations.

The shape that such forums could take is open for discussion. As everyone we spoke to indicated that they have been too busy keeping up with demand to dedicate enough time to introducing a dedicated productivity program into their operations, hosting a series of meetings, round-tables or seminars, isn't necessarily the best way to get the message across. In the interest of being

innovative, perhaps a more effective way to share the productivity message is through new media tools such as podcasts or simply going back to basics with business-to-business plant tours.

CONTINUED INVESTMENT

Tax credits for training and local support are just two examples of investment in the manufacturing sector. Targeted programs allowing savings on investments in machinery and research are also key factors in supporting more productive firms.

VI) Tax credits for investment

Everyone we spoke to indicated that the accelerated capital cost allowance program is a necessity for the manufacturing sector to thrive. While not all of the people we spoke to had taken advantage of it, many indicated that this type of program should have been introduced years ago, and that should it continue to exist, they would take advantage of it in the future when they invest in any new machinery.

Additionally, while a research and development tax credit on either the federal or provincial level is not applicable to some of the manufacturers we spoke to, the majority indicated that this type of support for innovation, research and commercialization, is vital for the continued success of the manufacturing sector. They were very supportive of the announcement that Alberta will have a provincial R&D tax credit starting in 2009.

The Ontario government has a program known as the Advanced Manufacturing Investment Strategy (AMIS) which is a \$500 million program to encourage companies to invest in leading-edge technologies and processes. AMIS provides up to 30 per cent of the total eligible costs of a program – up to a maximum of \$10 million – in the form of a repayable loan. Projects must either create/retain 50 jobs or invest \$10 million over 5 years and eligible costs include research and development, equipment and machinery, materials, training, or construction/leasehold improvements. As previously noted, Calgary manufacturers are not looking for no strings-attached funding, rather they just want to be able to compete on a level-playing field with other jurisdictions. A program like this one encourages firms in other provinces to invest in automation, training and innovation, in a way that Alberta firms cannot. Many of the people we spoke to were of the belief that if the Province can do more to introduce policies such as this one, that it would also signify that Alberta government supports the manufacturing sector.

Conclusion

For the past five years Calgary's economy has been growing at such a strong pace, that for manufacturers, priorities have been short-term and focused on keeping products moving and retaining staff. So while they generally understand

and embrace concepts related to productivity, their business plans and strategies do not reflect this. Productivity measurements come as a result of data collected for other purposes (i.e. payroll or inventory), instead of measuring for the sole purpose of becoming more efficient.

From our conversations with Calgary manufacturers it seems that process improvements come about when someone has a personal interest rather than as a business improvement tool. As such, there is often ineffective implementation and weak adoption by the firm as a whole. That is not to say that there are no examples of best practices by Calgary companies – it just seems that these are happening on an ad-hoc and informal basis. What is apparent is that manufacturers are in need of more tools to better understand how to formalize productivity programs within their firms and support that will show the reward for becoming more productive.

Sources:

Canadian Council on Learning
Canadian Manufacturers & Exporters
Canadian Federation of Independent Business
Conference Board of Canada
Globe and Mail
Institute for Research on Public Policy
Statistics Canada
TBM Consulting Group

Appendix 1 – Productivity Questionnaire

The goal is to understand where Calgary manufacturing companies stand when it comes to productivity initiatives. Key findings will be around the following questions:

- what productivity means to them
- what kind of productivity improvements they have already implemented
- which productivity improvements they plan to implement in the short and long-term
- what the main barriers are to implementing productivity improvements
- how they rank their productivity implementations against other firms in Calgary, Alberta, Canada and elsewhere
- how they plan to make investments in innovation, automation and/or skills training
- how flexibility and productivity interact
- what they need from industry associations and government partners to become more productive

Working from the theory that productivity implementations are centered around investment, innovation, flexibility and skills training, the questions are based around these main themes.

I) General Questions:

- 1) What are your biggest cost concerns/issues? (i.e. rising dollar, labour costs, taxes)
- 2) What cost advantages did you used to have that you no longer do? (i.e. exchange rate, low cost of industrial land)
- 3) What are your key determinants for future business growth? (i.e entering new markets, reducing operating costs, improving labour productivity)
- 4) What are your major constraints in achieving measurable improvements in business performance? (i.e. limited resources, cost, lack of qualified personnel)

II) General productivity questions:

- 5) Do you think you are less productive/more productive than other companies in Calgary, Alberta, Canada, overseas?

- 6) What are your goals for introducing productivity improvements? (i.e. cost reduction, removal of waste, reducing labour costs, continuous improvement culture)
- 7) What do you see as the main challenges in implementing productivity improvements? (i.e. company culture, lack of funds, lack of understanding, lack of measurable results)
- 8) What are your perceptions of productivity improvements? (i.e. great in principal, but hard to achieve, an empty slogan)
- 9) How important are productivity improvements to your company (now and in the future)? (i.e. important, we are implementing right away; somewhat important, we are implementing in the next 12 months)
- 10) Is your company enacting a formal productivity improvement program? If yes, what does it look like?
- 11) If you have a formal program, how long has it been in operation? What have been the results so far?
- 12) How extensively are productivity improvements deployed? (i.e. sporadically, at a process level, across the extend supply chain, company wide)
- 13) What do you use to assess the success of productivity improvements? (i.e. annual profitability, on-time delivery, inventory turnover)

III) Investment questions:

- 14) In what areas will you be investing in the next 12 months? (i.e. automation, R&D, process re-organization)
- 15) How much of your revenues will you be re-investing in these areas over the next 12 months? (i.e. percentage)
- 16) Do you take advantage of the Federal SR&ED tax credit program? (yes, no, too much hassle, ineligible)
- 17) Do you take advantage of the Federal Capital Cost Allowance?
- 18) Are you aware of the recently introduced Provincial SR&ED tax credit program? Will you take advantage of it?

IV) Innovation questions:

19) What does innovation mean to you? (i.e. new products, changes in the way automation is used, etc)

V) Flexibility questions:

20) What is your understanding of the relationship between flexibility and productivity?

VI) Training questions:

21) How much of your budget do you spend on formal and informal skills training? (i.e. percentage of payroll)

22) Will you be increasing your training budgets in the next 12 months? (if yes by how much, if no, why not)

23) What kind of in-house training do you provide? (i.e. technical skills, management skill, communication, literacy/math)

24) What are your main strategies to address future labour needs? (i.e. upgrade skills of current employees, hire younger people, simplify business processes, introduce automation)

25) What kind of incentives, if any, would help increase skills training in your firms? (i.e. training tax credit, lower payroll taxes, partnerships with educational institutions)