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BRITISH COLUMBIA INDUSTRIAL DEVELOPMENT BULLETIN

A bulletin concerned with industrial advances affecting the B.C. economy

International Outlook

U.S. growth, the impulse of the world economy, is expected to moderate through year end and into 1989. Forecast increases range from to 3.0% for 1988, and only 2.7% for 1989.

While inflationary concerns still exist, recent employment, housing and retail sales figures indicate that interest rate increases may be having their desired cooling effect. However, many sectors are still running near full capacity and the resulting supply bottlenecks are expected to push the U.S. inflation rate over the 5% level in 1989.

The longer range U.S. economic picture will hinge on a long term solution to the country's budget and trade deficit problems. Such a solution may begin to take shape after the presidential election.

Meanwhile, Japanese prospects remain rosy as increased domestic demand and rising imports have started to narrow its controversial current account surplus. Failure by OPEC members to reach any pricing agreement in the wake of the Iran-Iraq cease fire calmed some inflationary fears. Japan's economy is expected to see growth of some 4% by year end and inflation of around 2%.

Many industry analysts are forecasting a continued steep drop in the price of oil; this would send shock waves through the energy sector and affect terms of trade around the world.

What's inside

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National Outlook

Growth rate estimates for the Canadian economy in 1988 have been upwardly revised to around 4%, as residential construction

and business investment continue to make major contributions to the economy's over-all performance.

However, GDP growth will moderate in 1989 to between 2% and 3%, as business capital accumulations and investment capacity cools.

Unemployment rates have also been revised to a range of 7.5%-7.8%, down slightly from original estimates of 8%. This signals the strong growth in central Canada.

Inflation will remain controlled at around the 4% mark as the Bank of Canada continues to maintain its anti-inflationary stance. However, it is reasonable to expect the rate to increase slightly in 1989 as the effects of higher wage costs, commodity price increases and the North American drought are felt.

Provincial Outlook

The August provincial unemployment rate of 10.3% maintained the declining trend from 11.5% a year ago. This trend is expected to continue, culminating in an unemployment rate of around 10% by year end. A rate we haven't seen since 1981.

Provincial GDP growth for 1988 is expected to be around 3%, followed by somewhat slower expansion in 1989. This economic progress stems largely from business investment in the resource extraction and processing industries, active foreign investment and strong export demand.

Pulp and copper markets continue to maintain their strength as world prices continue to hit record setting highs. The strength of these commodities will help to offset softening prices for lumber and precious metals; these being affected by falling housing starts and oil prices.



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Innovation in Western Canada

The Organization for Economic Co-operation and Development (OECD) has recently published a review on innovation policy in the west, as part of a series of such policy studies.

The OECD examined the climate for innovation across the western provinces, in some instances even looking at the circumstances facing specific sectors. In B.C., for example, the review focused on the electronics, telecommunications and natural resource sectors. Three general problems affecting innovation were identified which concern the western provinces as a whole.

The review revealed that while western Canada is slowly reaching the necessary critical mass in high technology, more work is needed to overcome the reluctance of existing major industries to support growth in new sectors. Such support is crucial; the west's limited industrial base means that high technology can only grow rapidly if it builds on the strengths and momentum of our leading sectors.

The second problem noted was the lack of world class management skills. Again this is linked to the absence of support from major firms. The review suggests that with greater exposure - through joint ventures, purchasing, and other spin-offs - would come managerial networks and experience in world level competition, that would in turn build the needed managerial skills.

A third weakness, observed by the OECD, concerned provinces competing for high technology and innovation projects without a consistent policy framework or coordination of Western Canada's overall needs.

For B.C., the publication acknowledges that while the climate for entrepreneurship and innovation is good, the province needs its vigorous resource sectors to sustain this atmosphere. These sectors, notably forestry and mining, are themselves in need of major system upgrading to suit them to their increasingly competitive environments.

In terms of technological achievement, staff and products, our high technology sectors are beginning to make their mark, but again,

continued progress here depends upon more fulsome and rigorous support from major firms, most of which are linked to the resource base.

The OECD study also offers a number of closing observations: innovation is clearly multi-disciplinary and cannot be isolated as the responsibility of any one agent or one government; investment in technology should relate to the needs and strengths of the whole region (eg: telecommunications, biotechnology); existing industry must be actively encouraged to participate in the diffusion and adaptation of technology; and, there must be a new emphasis throughout the economy on the fundamental importance of high quality products.

Expert Systems

An outgrowth of work in the field of Artificial Intelligence, "Expert Systems" technology is more commonly associated with science fiction than with the real world of business. This is already a misconception. More and more companies in manufacturing, engineering and design, telecommunication, finance and banking, and numerous other fields, have demonstrated significant productivity improvements through the use of expert systems.

What is an Expert System? In the business environment, an expert system is a human specialist's knowledge, translated into a consistent set of rules and stored within a computer system. Non-experts may then interrogate the expert's stored knowledge. An expert system draws conclusions and makes recommendations from rules of thumb and relationships derived from human experience. It is designed to use stored expert knowledge to evaluate pertinent factual information, which might be obtained through direct interaction with the user, from a computer database, or via a process control monitoring system.

The primary benefits to business are accessibility, with knowledge more widely and permanently available, consistency, in the reasoning process, and productivity, through the elimination of knowledge bottle necks.

Expert systems can be developed using a relatively low-cost software product called

LEVELS which is designed for the non-technical user, and can be utilized across a range of computer environments. Additionally, expert systems laboratories have emerged in B.C. - at Camosun College, BCIT, and recently Discovery Park - where research is conducted with industrial applications in mind.

J-I-T

Many North American manufacturers tenaciously cling to a number of beliefs explaining why their Japanese counter-parts achieve such persistently high levels of productivity, quality and cost competitiveness: they pay their employees less, they are less regulated, and their culture alone inspires such performance. These are myths. Japan, and its neighbouring "four tigers" South Korea, Taiwan, Singapore and Hong Kong, contend with increasing wage demands, high transport costs, tariffs, and strong currencies. Consequently, a more plausible explanation much of this manufacturing success lies in the innovative approaches that have been applied to production.

Just In Time (JIT) production is a "new" approach to manufacturing - to the flow of components through to final assembly - that seeks to minimize inventory investment while maintaining, or improving, customer satisfaction. JIT attempts to eliminate stock between process steps, reduce work in process to an absolute minimum and minimize idle equipment, workers and facilities. The rationale that underlies JIT is not altogether new; Henry Ford employed its basic precepts in the manufacture of his first automobiles. The modern approach simply extends these early assembly principles to the production of sub-components.

While traditional manufacturing operations produce batches of parts that are then pushed through the system, JIT operates on a demand pull principle. Parts are only produced as fast as they are needed for the subsequent process, no extra production or inventories are permitted. Consequently the components move through the line one at a time, instead of in batches of hundreds or thousands.

The advantages of the JIT system are: dramatic reductions in lead times; early

detection of defective components, which eliminates the need for rework shops; easy process and product experimentation on the line; and, the removal of the inventory security blanket, which often obscures real production costs and problems.

A further element of JIT production is that workers are encouraged to make suggestions and implement process and product improvements. Employees are also given authority to shut down the assembly line whenever they fall behind or discover a defective part. As a result, employee performance improves when entrusted with such responsibility and authority.

The results for JIT users are impressive. Japanese companies that have implemented JIT systems have reported 30% increases in labour productivity, 60% reductions in inventories, 90% reductions in quality rejection rates, and 15% reductions in necessary plant space. General Motors used the approach to slash inventory-related costs from \$8 to \$2 billion in the space of five years.

Despite these advantages, JIT has met considerable resistance in North America, due largely to misconceptions as to its applicability and the misunderstanding that all of its elements must be put in place simultaneously. In fact, JIT production can be done in steps and is appropriate for any manufacturer who's orders have a fairly predictable pattern. In B.C., the approach has been successfully implemented by a few leading firms.

While JIT is not a cure-all for every manufacturing problem, it does offer the potential for significant improvements in efficiency and quality; improvements that will be needed in the business climate of tomorrow.

The High Tech Service Gap

Trade deficits in the service sector have more than offset surpluses in manufactured goods for a number of years now, and Canada's current account balance has consequently continued to edge farther into the red. Unfortunately, technological services have not been immune from this deficit problem.

Recent Statistics Canada analysis indicates

that the country has suffered from a persistent balance of payments shortfall in technological services. While not comprehensive, and therefore somewhat understated, the StatsCan figures show that the deficit in tech services has grown from \$27 million in 1965 to \$161 million in 1986.

What this technological balance of payments represents is a summary of all transactions relating to the purchase and sale of technological services, information and rights, and thus indicates that Canada has been importing much more technology than it exports.

While this technology deficit suggests that Canadian industries are at least availing themselves of technological developments in other countries, it also emphasizes the fact that, overall and over time, we are not keeping pace with our international competitors.

Figures reveal that the largest technological service deficits, totalling some \$270 million, were associated with five industries: chemical products, business machines, electric/electronic products, petroleum/natural gas and rubber/plastic products. However, the deficits in these industries were partially offset by surpluses in technological services associated with other service industries (\$84 million) and - a particularly bright spot - the telecommunications equipment industry (\$156 million).

Trend analysis for the last five years indicates that while the surplus associated with the service sector has grown more than seven fold and the telecommunications surplus has remained relatively stable, deficits in the five problem industries show no consistent pattern. The business machine deficit has declined by half while rubber and plastic products' has grown five fold.

These findings may reflect the international technology level of these industries and indicate the direction they are heading. Telecommunications appear to be maintaining a strong international position, and the service sector in general is strengthening. The business machine industry, although still below international standards, is improving; meanwhile, the level of technological expertise in the rubber and plastics industry seems to be getting relatively worse.

Did You Know ?

The average volume of precipitation that falls on B.C. per day: 560 billion gals.
Amount of water required to make 1 ton of paper: 50,000 gallons
Refine 1 ton of copper: 100,000 gallons

Percentage of Cdn. office workers who think it very important they make a significant contribution to their company: 72%
Percentage of senior executives who believe it very important their office workers make a significant contribution: 54%

Proportion of executives who obtain needed information through a personal visit or telephone call rather than relying on office staff: 80%

Number of B.C. jobs lost for each 1% reduction in land available for industrial forestry: 2,400

Number of friends the average dissatisfied customer will tell his story to: 9
Percentage that tell more than 20: 13%

Proportion of Americans who want to live in a small town or rural area: 1/2

Projected effects of removing developed nations' farm subsidies:
Reduce the U.S. budget deficit by: \$40 bil
Improve the trade balance by: \$42 bil
Gains for developing countries: \$26 bil/yr

Gross profit (\$U.S.) per tonne of pulp, B.C. coast producer
January 1986: \$20
July 1988: \$310

Percentage of ordinary small businesses still in operation after 5 years: 25%
Franchise operations: 90%

Average annual percent change in productivity 1981-86:
U.S.A.: 1.05%
Canada: 1.25%
Japan: 3.10%

The number of fireflies required to produce 60 watts of light: 137

Industry Science and Technology Canada

A new entity - Industry, Science and Technology Canada and International Trade Centre - is being created to replace the Department of Regional Industrial Expansion. The new Department (ISTC), with offices in every province and territory will, as the name implies, seek to improve the integration of the scientific and technological communities with the industrial economy.

ISTC is a response to the fact that the industrial economy is changing: competitive forces are more robust; the level of technology is rising rapidly across all industries; and, international market opportunities are shifting. Hence, industrial application of technology has emerged as one of the most fundamental components in this atmosphere of change. New and advanced technologies are present in new product development, in improving production efficiency, and in gaining market acceptance.

And at the base of technology's new power often lies science. Science, pure and applied, has become vital as a basic contributor to industrial growth. Ideas, technology, materials, methods and skills are all payoffs of long term investment in science and technology. Consequently, ISTC represents a federal commitment of financial and human resources of unique competence and capacity to work with industry in gaining the greatest advantages from the prospects and challenges offered in these changing times.

What will ISTC and its International Trade Centre do to support the efforts of industry in B.C.? ISTC will be primarily a service department: an agency boldly advocating the interests of industry, identifying areas of change and opportunity for business response and shaping policies which will enhance the competitiveness of our industrial and service sectors.

It has been recognized by industry and government that effort in these areas - advocacy, intelligence and framework policies, and their subsequent impact on the economic climate - often have more of an influence on investment and production growth than financial assistance programs.

While these types of services are important to

industry, their effects may not be immediately felt by individual entrepreneurs. As a result, there will also be a level of direct services to business. Foremost among these services will be those associated with the work of the International Trade Centres, located in all of the regional ISTC offices. Services available through the Centres will include: advice on market opportunities; counselling on export practices and requirements; advice on free trade impacts and responses; identifying trade irritants; conducting trade development seminars, trade shows, fairs and missions; delivery of the Program for Export Market Development and the maintenance of an international export opportunities data base known as WIN Exports.

Another important group of direct services will be those in the area of technology and industry development. Here, efforts will be devoted to searching out and offering advice on emerging technologies, pursuing opportunities for the transfer and application of new technology to local industry, bringing investors in touch with investment opportunities, providing advice on access to national programs such as the Microelectronics and Systems Development Program, the Defence Industries Productivity Program, the Technology Inflow Program and promoting the industrial benefit opportunities associated with major procurement projects. Throughout, special attention will be paid to strategic technologies - ones which increasingly underpin the competitive performance of our industries - information technology, biotechnology and advanced industrial materials. Industry is anxious to develop, acquire or apply these technologies and ISTC will help.

This is just a sampling of the work which will come to characterize ISTC and the International Trade Centre. It is our goal to see Canada's industries grow and maintain their world class status by maximizing the benefits that our scientific and technological communities have to offer. In forging a stronger, more encompassing, link between industry and science we feel that Canada can more rapidly adapt to the challenges and possibilities abundant in our rapidly changing environment, now, and into the twenty-first century.

Calendar of selected events

Marketplace (Consultations with Trade Commissioners), October 11, 1988: Victoria - Coast Harbour Tower, Nanaimo - Tally-Ho Hotel; **October 12-13, 1988:** Vancouver, - Robson Media Centre; **October 14, 1988:** Kelowna - Sandman Inn, Kamloops - Stockmen's Motor Hotel, Contact: Peter Zalite, International Trade Centre, (604) 666-1437.

Federal Seminar for High Tech Companies, October 20, 1988, Discuss points of contact in the global network of government R&D programs, Discovery Park, Burnaby, British Columbia, Cost: Free, Pre-registration Contact: Susan Matasi (604) 666-5424.

Technology Transfer in the Pacific Rim, October 21, 1988, Hotel Georgia: Regal Ballroom, Vancouver, British Columbia, Cost: \$20 (\$10 for students and seniors), Contact: Dr. W.G. Bailey (604) 291-3321.

Tourism - A Vital Force for Peace, October 23-27, 1988, Vancouver Trade and Convention Centre, Vancouver, British Columbia, Contact: L.J. D'Amore (613) 526-3280

Exporting to the U.S.A. Seminar, October 25, 1988, Burnaby, British Columbia, Contact: Zen Burianyk, Federal Business Development Bank, (604)

Computer and Communication Show, November 1-3, 1988, Vancouver Trade and Convention Centre, Vancouver, British Columbia, Cost: \$6.00, Contact: Helene Lévasseur (604) 433-5121.

U.S. Defence Initiatives (Supplier Sourcing Seminar), November 3-4, 1988, B.C. Enterprise Centre, Vancouver, British Columbia, Contact: Rick Stephenson, International Trade Centre, (604) 666-1443.

Action for Excellence Seminars: A Passion for Excellence (Nancy Austin), November 9, 7-10pm, (trade show 5-7pm), 1988, New Harbourside Hotel, Vancouver, British Columbia, Cost: \$65.00 (group rates available), Registration contact: (604) 925-3579.

International Business and Investment Exposition, November 22, 2-8pm, November 23-24, noon-8pm, 1988, Currently scheduled speakers include: Hon. John Crosbie, George Magnus, Louis Rukeyser, Vancouver Trade and Convention Centre, Vancouver, British Columbia, Cost: \$10.00, Contact: (604) 669-3818

The Pacific Connection: How Canada-U.S. Free Trade Opens Export and Investment Opportunities in the Pacific Northwest and the Californias - The Financial Post Conference/Air Canada, November 22, 1988, 8:30am - 12:30pm, The Pan Pacific Hotel, Vancouver, British Columbia, Cost: \$325, Contact: Paula Gould (416) 596-5681.

Conference Board of Canada: Canadian Tourism Outlook Conference, November 22, 1988, Hilton International, Toronto, Ontario, Contact: Ann-Marie Galla (613) 526-3280, extension 240.

Energy '89 Conference: Canadian Institute of Energy, December 1, 1988, Topics to be addressed include gas exploration, energy and free trade and government energy policies, The Hotel Vancouver, Vancouver, British Columbia, Contact: Gail Edwards (604) 669-0900.

The Sixth Pacific Rim Opportunities Conference, February 27 - March 2, 1989, Sheraton Centre, Montreal, Quebec, Cost: \$350 includes registration, interviews with trade commissioners and lunches for all four days, Contact: Diane Caldbick (613) 238-4000.

B.C. Computer and Business Show, February 21-22, 1989, Victoria, British Columbia, Contact: Linda Burton (604) 433-6125 or 1-800-268-7742.

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