ECONOMIC IMPORTANCE OF WOOD PRESERVATION

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Why treat timber? The conventional answer is to prevent deterioration by fungi and insects in service, but I would like to go beyond that answer. At least two persuasive arguments can be made that can appeal to the consuming public. The first focuses on resource conservation. It is clear that even present demand for wood raw material in Canada is such that the timber resource in Canada is over-committed in certain areas of the country, and that every effort is needed to utilize the products of the forest to their full potential to avoid depletion of our timber base. A rough estimate of the service life of properly treated wood products is six times that of untreated materials. If we could just increase the use of treated wood for structural purposes by 5% per year, we could save one-quarter of a million cubic meters of standing timber annually which otherwise would have to be cut to provide replacement material for deteriorated structures. This is equivalent to about 50 MM fbm of lumber.

A recent internal study was conducted by the U.S. Forest Service to examine the opportunities to improve timber supply in that country through improved technology and utilization. Four major techniques were identified:

(1) Raw Material Extension (use of hardwoods, logging residue and recycling).

(2) Innovative Structural Products (veneer-particleboard composites, laminated veneer lumber)

(3) Process Improvement (higher yields of lumber and pulp)

(4) End Use Improvements (effective engineering of building and building components, reduction in wood deterioration by preservative and finish applications).

Aggressive application of these techniques could add, by the year 2000, the equivalent of 4 billion cubic feet of wood annually to the present U.S. consumption of 14 billion cubic feet — or an increase of over 28 per cent. This additional timber could be realized *now* at relatively low cost compared to other options involving intensive forest management.

The opportunity to reduce wood deterioration and thus enhance timber supply can be realized only by studies designed to develop and evaluate improved preservatives and finishes, and improve application methods. Field demonstrations and tests are also required to convince building officials and contractors alike that preservation pays dividends.

This report argues that if research and development efforts on wood preservation were carried out on a modest scale (seven more man-years between 1981 and 1985, and similar growth thereafter) along with some increasing private efforts to implement new technologies, by the year 2000, an annual saving of 300 million cubic feet of timber would be realized. This saving was deemed to exceed that which could be achieved by instituting both improved quality control methods and sawing mechanics into sawmills!

Timber can substitute for other materials in certain structural applications. The preserved wood foundation is an obvious example. Others may be more obvious, because wood can *recapture* some of the markets it has lost in the past to aluminum siding and windows and to concrete railroad ties. The advantage to wood lies in the relatively low energy requirement for conversion of logs to a unit dry weight of product. Reinforced concrete, cast iron, and aluminum require much more process energy for the same unit weight – 8,16 and 39 times more, respectively, than does lumber. Although plywood requires twice as much process energy as lumber manufacture, it is still a minor energy consumer compared to these other structural materials.

A recent (October 23) closure of a special type of pole plant in Kamloops, B.C. may serve to underscore this point. This was a $5 million plant designed especially to produce concrete poles for sale to B.C. Hydro, to accommodate their needs for 24,000 distribution poles and 10,000 transmission poles annually. But B.C. Hydro is disenchanted with the poles, because they cost $300, or almost three times that of wooden poles. An important element of this cost differential is the much greater process energy requirement for concrete materials. Coupled with the high initial cost of the concrete pole is the more expensive erection cost, due to heavier transport and equipment needs.

At the same time you shouldn't feel complacent about this, and feel that all will be well in the long run if you just wait patiently for traditional markets to return. The fact is that a concrete pole may have a service life of 4 times that of some treated poles, so you should aim to improve treatments and their cost-effectiveness compared with competing materials.

MARKETING OF TREATED PRODUCTS

I believe that there is an opportunity for increased sales to industrial and utility customers, and to contractors and home owners if we provided sound economic examples pointing to the advantages of properly chosen, well-treated, wood products. Appeals made directly to the public on the basis of forest conservation might attract their interest and this interest might be turned to sales on the basis of labor-saving economics. Why not take a leaf from the aluminum siding people, who still are able to sell an increasingly expensive product (driven upward by energy costs) on the basis of its permanence, once in place?

This can't be done without educating the public on where treated material can be obtained, and once available, how to use it. Treated lumber, siding, and posts should be more available at the retail outlet level if this potential for increasee sales is to be recognized.

SCOPE OF THE WOOD TREATING INDUSTRY

According to Statistics Canada, the industry today is about a $100,000,000 business, and growing. The statistics on the industry indicate that the value of treated products (own manufacture and custom work) increased from $70 million in 1976 to $93 million by 1978, the last year for which data are available. There are some disquieting statistics as well which indicate that Canada isn't developing all the raw wood required for treatment at home. In 1974 and 1975 Canada, for the first time, became a net importer of poles, probably because of the strong lumber markets of the immediately preceding years. The same happened again in 1978 and 1979 during the strong lumber market of that period. Likewise, at least since 1976 (and probably several years before), Canada has been a net importer of railroad ties. The trade imbalance was only about $3 million, until 1979, when it shot up to $22 million.

Being in this deficit position in poles and ties is one example of the need to develop better treating techniques for our native Canadian timbers, perhaps spruce primary among them. It is unlikely that we can look to others to solve this problem for use. We likewise should be developing more environmentally benign chemicals for preservative treatment, and developing new treated construction products.

Paul Samuelson, the well-known economist, has said "Expanded research can pay high social dividends in terms of productivity", and he goes on to say "The single least controversial measure for inducing greater growth is promotion and subsidy of more research and development."

RESEARCH, THE KEY

In other words, we need research to capitalize on opportunities. We can tap the financial resources of others to fund work needed to obtain this better knowledge of chemicals and techniques, and in fact can tap directly the knowledge accumulated in these areas both inside and outside this country. But to do this you must have more technical people and better expertise to permit both communication with researchers and transfer of R & D to your benefit. Not only is institutional research very thinly spread in this country, but the technical knowledge existing in many industries is far short of that required to appreciate new research and development findings as they become available.

I really don't want to dwell on the dreary statistics concerned with R & D efforts in Canada in both the public and private sectors. What I'd rather do is give some positive suggestions of how you as an industry might help yourselves by taking advantage of current research schemes.

As an example, the Natural Sciences and Engineering Research Council (NSERC) might be cited. The major function of this council is to dispense research grants to university staff members in Canada. I would like to think that some of you could get involved with University staff in Chemistry, Biology, Forestry and Engineering, and get them interested in problems of concern to your industry. I mean get them interested to the point that they might address their research applications to a subject that is important to you. If you were successful in this effort, you might get research done at no cost to you. If the research were successful, you might continue collaboration with the university researcher that would enable him to receive a PRAI grant (Project Research Applicable in Industry) from NSERC. These PRAI grants allow the university staff member to continue his work beyond the identification of a specific, novel technique, process or product to the point of demonstrating sufficient promise to be of commercial value. That is, the PRAI grant gives the unviersity researcher a chance to show that his idea has enough promise to justify its transfer to industry for subsequent development and exploitation. As a collaborating company, you still need not provide much more than moral support, although sometimes your complementary facilities might be used if unavailable at the university.

Why not visit some of your local universities or strike up some dialogue with receptive professors? Many of them are yearning to be relevant, but are criticized for their ivory-tower attitudes. But ask yourself how willing you have been to take initiatives with university personnel. These efforts might even lead to a university researcher applying to NSERC for a Senior Industrial Fellowship, in which case the recipient would spend a minimum period of a year with an industrial organization or "certain quasi-industrial federal corporations" (Forintek?) or provincial utilities. Again, this would be at no direct cost to the company, because NSERC and the university together would provide their salary, and travel grant if required.

Perhaps I should give you one other example, this one the New Technology Employment Program of Employment and Immigration Canada. This program is for research institutes and private sector firms with less than 300 employees. It subsidizes the salary of new post-secondary graduates who have not been able to find employment in their specific discipline. All that the company has to do is to show that the new employee will be involved in development or application of some new innovation for product or process development. The federal contribution to salary is up to 75% of wages, to a maximum contribution of $290 per week for one year. Several people could work for a single employer in this capacity, up to a maximum of $150,000.

Finally, there is Forintek, which sooner or later you are going to be asked to support with your company funds. Make sure that these funds are well invested, by supporting a mix of short and long-term research projects that will lead to capturing the expanded market that lies ahead – provided that you are willing to make the effort in research, development, public education, product promotion and retail connections.