By GRAEME RODDEN, Executive Editor

Cascades believes that the real challenge is to manage innovative ideas so they become commercially successful

INNOVATION MUST NOT BE LEFT TO CHANCE!

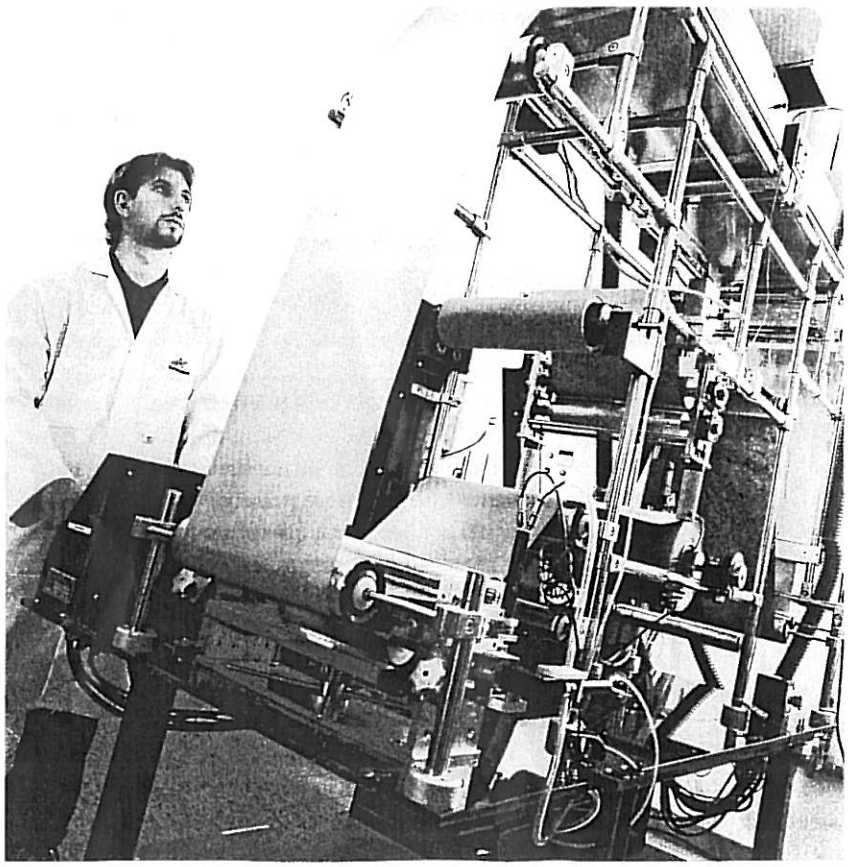
Today, particularly in North America, it is a fact of life that private pulp and paper research and development centers have gone the way of the Dodo bird. Most companies now rely on universities or centralized R&D institutes to do the research, which is mostly applied, that industry needs.

Any economic downturn, such as the global downturn currently occurring, makes the situation worse. Cascades' R&D centre in Kingsey Falls, QC, is an exception. In fact, it seems to be opposing this trend. Company president and CEO Alain Lemaire said, that, "Cascades is counting on R&D and innovation to get the company through the crisis."

"R&D and innovation are the only ways to ensure we maintain a competitive edge to survive and thrive," adds Cascades' general manager of R&D, Roger Gaudreault.

The company spent C$47.2 million ($37.8 million) and C$44.5 million ($35.8 million) on R&D in 2007 and 2008 respectively, placing it among the top 50 corporate R&D spenders in Canada.

Cascades has two R&D facilities; Cascades R&D Center in Kingsey Falls (CRD), about 120 km southeast of Montreal, which employs 40 researchers, and the Packaging and Innovation Center (P&IC) in Mississauga, ON, having 10 employees under its Norampac banner.



The current economic crisis has had a positive effect on the company's rate of innovation

FOUNDED IN 1964

Kingsey Falls is still the headquarters of Cascades, which was founded 45 years ago when the Lemaire family purchased a closed mill in this small town, from Dominion Paper Co. CRD was opened in 1985 and is currently the largest private R&D facility in the Canadian pulp and paper industry. At Kingsey Falls, research covers: bleaching, deinking, food contact, microbiology, microscopy, paper physics, process engineering and machine operation, wet end and dry end paper chemistry, coating and surface treatment, plastic, tissue softness, and molecular modeling.

The P&IC specializes in containerboard and corrugated product performance analysis, pre-shipment testing and evaluation of packaging for the transportation of dangerous goods.

Cascades has set up its operations such that each division is a separate company and each is expected to be profitable. This is also valid for the R&D center in Kingsey Falls where the sales in 2008 reached C$3.9 million (US

$3.1 million) and profit (EBITDA) hit C$282,000 (US $230,000), Gaudreault adds.

Cascades is a widely diversified company with about 100 operating units located in Canada, US, France, Italy, Germany, UK and Sweden. Besides containerboard and corrugated products, Cascades' product range includes tissue, fine paper deinked pulp, and numerous specialized products such as molded pulp, Honeycomb, laminated board, linoleum felt, etc.

Therefore, the expertise provided by the R&D centers is widespread. Working with so many divisions making such a wide range of products does not pose any particular problem. "Because we are so niche market oriented, our R&D services have been adapted to provide solutions for all sorts of different situations," Gaudreault explains.

For example, personnel at the CRD helped design the process for the new deinking line at its Memphis, TN, tissue mill, which started up in September 2007. Although the line is new, the equipment is secondhand and some of it had to be reconfigured to fit the process.

The research and development carried out is both customer and company driven. But, Gaudreault cautions, "We have many brilliant ideas that we would like to promote as products, but if there are no customers asking for them, that is they are not market driven, it is difficult for us to push the product".

The current economic crisis has had a positive effect on the company's rate of innovation. Why is this? How has the downturn changed the way Cascades does business? "People want answers more quickly," Gaudreault responds. "There is a sense of urgency. There has been a switch in the last few years from push to pull. Our mills and converting plants are pulling us in for help, which invariably triggers innovation!"

WHAT IS INNOVATION?

The emphasis on the market underlies Cascades' approach to R&D. For example, it is essential to consider Cascades' definition of innovation. It is a product, process and/or method that is new, which has been developed and creates a competitive edge (a differentiation that is commercially successful for Cascades). For more details, see Lemaire's *From the Mill* column in *PPI*'s April issue (p.15). Marketing is a key component of the innovation process. Gaudreault claims that good marketing can increase sales by a factor of two or three.

The Cascades' Innovation Management System (Fig. 1), is a funnel-like system with four stages:

1. Identifying opportunities, generating ideas linked to the opportunities, and screening the ideas
2. Selecting projects according to the group's strategy
3. Developing innovation projects
4. Commercialization.

The left-hand side lists "who" are involved at each stage and on the right-hand side are examples of tools that can be used throughout the process. The innovation guidelines make it clear that any innovation is green and sustainable from the start to merit further development. The innovation management system increases efficiency to innovate.

What may also help this "pull" is the fact that many of the previous R&D experts move from the CRD to work in a mill, usually after five years. In fact, 21 scientists who had worked at the CRD currently hold key positions within Cascades mills, including: vice president, mill manager, production manager, technical manager and machine superintendent. They are ambassadors of innovation bringing expertise that they can introduce at the mill level and facilitate innovation.

THE ACCOMPLISHMENTS

The innovation management system sounds fine, but what investors want to see is results. Fortunately, Gaudreault has numerous examples of product innovations that Cascades is producing.

Recycled bleached market pulp: A Canadian first introduced in 1988. It is processed chlorine-free and FSC certified, and has similar optical properties to virgin pulp. Sales have grown from 36,000 tones in 1996 to 62,300 tones in 2008.

Repulpable humidity barrier: Introduced in 1994, it now claims 90% of the North American market for repulpable packaging. Sales increased about 45 times between 1994 and 2008.

Molecular modeling

In the April 2006 issue of *Pulp & Paper*, the inaugural pulp and paper molecular modeling symposium was reviewed. The impetus for the symposium was provided by Roger Gaudreault, following up on his PhD work in molecular modeling.

The second symposium was held in 2008 but was expanded to include fundamental and classical pulp and paper modeling. Its aims were to stimulate the use of molecular and classical modeling in the pulp and paper industry and to help develop more effective molecular systems and to provide an understanding of the underlying mechanisms. Representatives from five countries attended. Among the key ideas discussed were: molecular orbital modeling of dendrimers, nanotubes and water on aragonite surfaces; adsorption of anionic, cationic and non-ionic starches on a cellulose model surface; filtration efficiency of random networks. These are the future trends, adds Gaudreault. The next Symposium will be held in 2011!

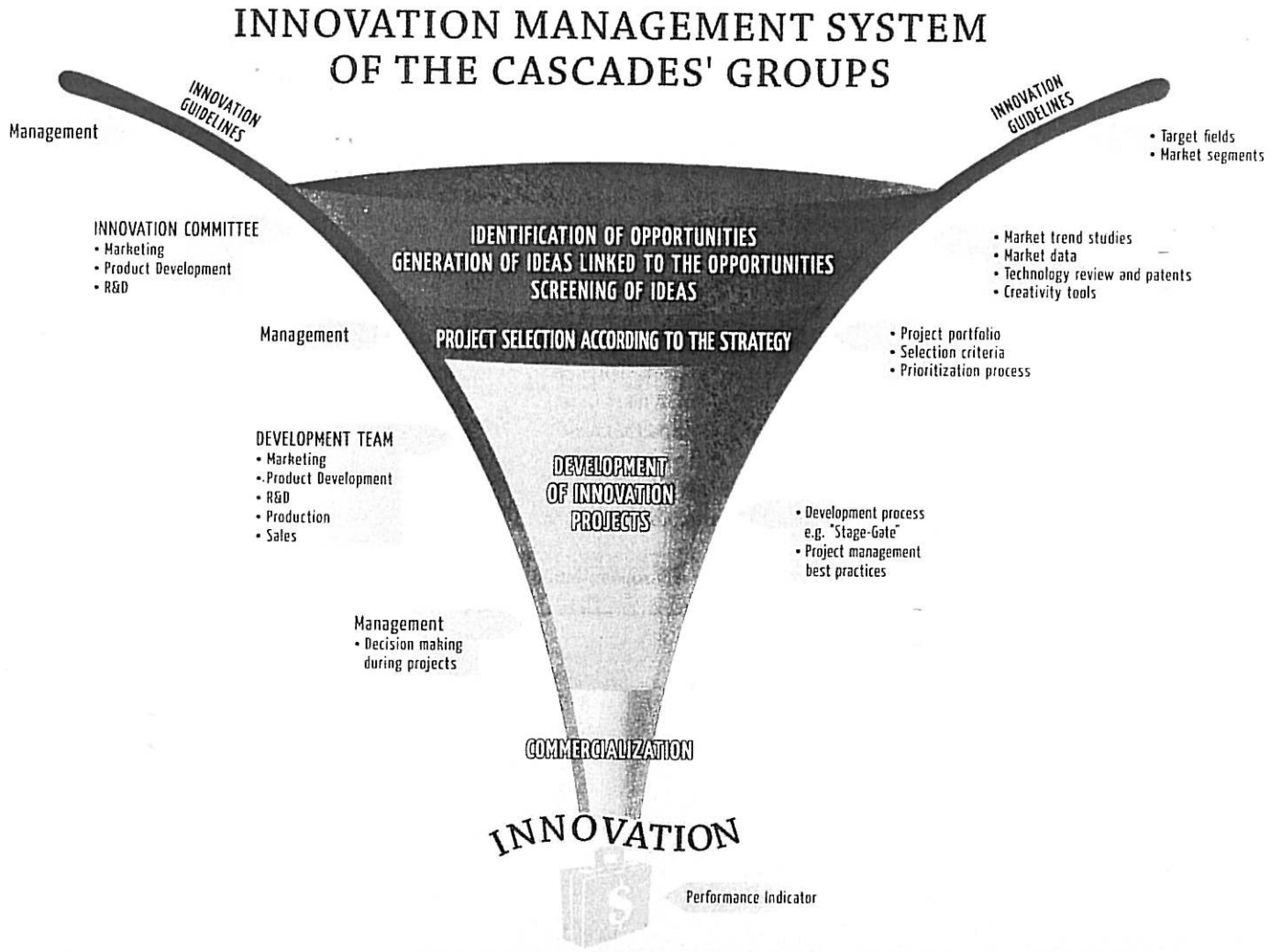


Fig. 1 - **THE LEFT SIDE OF THE FUNNEL SHOWS WHO IS INVOLVED AT EACH STAGE OF THE INNOVATION MANAGEMENT SYSTEM; THE RIGHT SIDE SHOWS THE TOOLS THAT CAN BE USED IN THE PROCESS**

Recycled tissue: Introduced in 2004, this Cascades' tissue family is made from 100% recycled fiber. Sales reached 1.6 million cases in 2008.

Pizza pads: Smaller in size than the normal corrugated single-face pads that sit under a delivery pizza, they have 80-90% recycled fiber content, are grease resistant, feature an Omega-3 barrier and are PFOA and PFOS-free.

Furniture packaging: Using honeycomb combined with corrugated packaging design, it helps eliminate polystyrene as a protective packing material by up to 84%. It makes packaging for this application up to 80% recyclable compared with 26% previously.

Rolland Enviro100 family: Fine papers made from 100% post consumer furnish. The Rolland Enviro100 Print grade was chosen for the Quebec edition of the sixth Harry Potter book: *Harry Potter and the Half Blood Prince.* Sales of Rolland Enviro100 family rose from 7,520 tones in 2005, to 44,200 tones in 2008. The trend is similar for 2009.

Additional innovative research efforts include:

Moulded pulp mushroom container: This is made from 100% recycled material and is biodegradable. It has been shown to keep mushrooms fresh longer than plastic containers, that is extends the shelf life.

Online stickies analyzer: Led by Nicolas DiCesare, this allows online detection of macro and micro stickies in pulp (without filtration).

Bioactive paper network (Sentinel): This is cooperative effort by the Canadian Research Network that includes Cascades, industrial partners and numerous Canadian universities. The object is to detect and/or

deactivate bacteria, for example E. coli and Salmonella sp. If a piece of contaminated meat were placed on the paper, the paper would change color. This marks the fourth year of a five-year research network. Gaudreault notes that no commercial product has come out of it yet although laboratory results are encouraging.

Life Cycle Analysis (water index): A framework and operational methods are being developed by the CIRAIG at the Ecole Polytechnique of Montreal in Quebec within the international working group of the UNEP-SETAC Life Cycle Initiative and in partnership with industrial partners, Cascades being a very active one among them. The index predicts what effects the use of water in a process/product would have on the environment. It takes into account water quantity, quality, scarcity and the capacity of the socio-economic environment to compensate for water use. In 2008, Cascades claimed to use six times less water than the Canadian average to produce a ton of paper products.

Nanotechnology (MATBAR): This is a European-based project that is developing a renewable resource-based functional barrier to replace petroleum-based latex. The three-year, Euro 3.3 million project wraps up in 2009.

In his paper at the annual PAPTAC meeting held in Montreal in February 2009, Gaudreault said that traditional strategies will make it difficult to win new markets. "To compete, we must quickly and effectively increase our ability to innovate."

However, to succeed, there is a need for an innovation management system to increase the efficiency to innovate. "Innovation is a structured process, he added. Sixty good ideas will lead to seven good projects and one innovation.

It takes time to innovate but the time to market is continuously decreasing, consequently, there is a firm need for a structured process. **PPI**

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