NRC·CNRC

From **Discovery** to **Innovation...**

Science at work for Canada

SAGUENAY

Quebec

NRC Technology Clusters

COMMUNITY INNOVATION, ECONOMIC GAIN

Through dynamic and rapidly growing technology clusters, the National Research Council advances world-class R&D in collaboration with Canadian communities. Using its research facilities as hubs for community innovation, NRC partners with universities and industry to inject local drive into the Canadian economy.

Saguenay Region—Aluminium Technologies

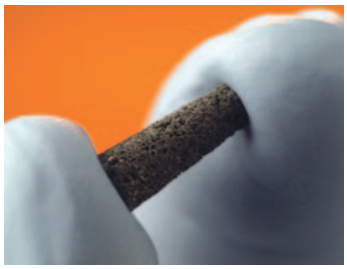
Canada is one of the world's top two exporters of primary aluminium. NRC's bold strategy to transform a significant portion of those exports into value-added offerings has created a vibrant technology cluster around the "Aluminium Valley" in Quebec's Saguenay region.

Investing in the community

In the late 1990s, NRC targeted Saguenay as Canada's most promising investment site for pioneering aluminium transformation R&D. The reason: more than 90 percent of Canada's aluminium production is situated within a 500 square kilometre area in Saguenay. In 2002, NRC constructed its state-of-the-art research facility—the NRC Aluminium Technology Centre—to serve as a hub for the region's most enterprising researchers. The Centre provides cluster stakeholders with wide-ranging support to explore the most profitable ways to transform aluminium into durable, lightweight components for a host of industries.

Building critical partnerships

NRC has nurtured several key partnerships with local aluminium transformation stakeholders in Saguenay. These partnerships play a critical role in NRC's efforts to stimulate groundbreaking research, disseminate world-leading knowledge and commercialize promising technologies.



NRC's partners in Saguenay include:

- Alcan Inc.
- the Quebec Centre for Aluminium R&D
- the Trans-Al network, an association of aluminium parts manufacturers
- the Société de la vallée de l'aluminium, a business development organization funded by the Quebec government
- the Université du Québec à Chicoutimi along with REGAL, a provincial university aluminium research network headquartered at Université du Québec.

Targeting success

To ensure the region's cluster remains focused on the most achievable and potentially lucrative goals, NRC's strategic plan targets two broad categories of development: advanced forming, and joining (assembling) technologies.

In the first category, NRC guides researchers and emerging companies through training in die-casting, hydroforming and other processes that form solid aluminium into lightweight, usable parts. The second category involves R&D of laser and friction-stir welding, adhesive bonding, and the mechanical assembly of aluminium parts.

NRC provides advanced computer modeling and state-of-the-art instrumentation for visiting researchers, helping to build a critical mass of knowledge and research that the fledgling cluster can use to commercialize its pioneering ideas.

ATTRACTING TOP-FLIGHT TALENT

Located on the grounds of the Université du Québec at Chicoutimi, the $57 million NRC Aluminium Technology Centre attracts top talent by providing pioneering companies with technical support, expertise and lab facilities to develop value-added aluminium products and processes. The Centre's 60 NRC staff, 20 guest researchers, and 20 young scientists receive advanced training to bring new technologies to market.

MAKING CARS LIGHTER

Concerns over energy efficiency, durability and performance have made the auto-parts industry a gigantic potential market for aluminium transformation technologies. In fact, since 1998, the amount of aluminium used to manufacture cars has risen by more than 130 percent. Auto giants such as General Motors now clamor for reliable, light-weight aluminium parts since they can be up to 40 to 50 percent lighter than their steel counterparts.

Transforming technology into business

NRC offers strategic services to businesses that want to take their innovations to market—easing the transition from small start-up company to bona fide industrial presence.

Assisting with industrial research

The NRC Industrial Research Assistance Program—aimed specifically at helping small- and medium-sized businesses develop technologies for market—contributes funding and expertise to all NRC clusters, including Saguenay's.

The program has helped link several Saguenay clients to expertise at the NRC Aluminium Technology Centre in such areas as purification of aluminium, metallurgy, and parts for high-performance bicycles, another key market for aluminium technology. It has embarked on collaborative projects with firms investigating such things as the latest aluminium-related laser technology and groundbreaking work in aluminium tubing. Moreover, the program is extensively involved with Quebec's Trans-Al network, a group of more than 100 pioneering small- and medium-sized enterprises.

Best available science and technology literature

NRC is a world leader in electronic publishing, and Canada's largest and best resource for scientific, technical & medical information. NRC's information specialists are highly active in Saguenay's aluminium technology cluster, conducting several hundred information searches a year and putting key publications in the hands of the region's leading innovators. They offer technical and business users leading-edge information and business-related services, including access to hundreds of relevant databases and thousands of scientific and technical journals.

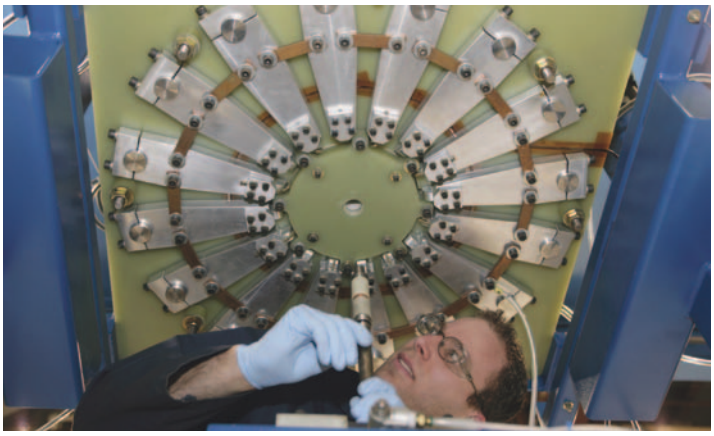
CLUSTER FACTS AT A GLANCE

- Canada is the world's second-largest exporter of primary aluminium
- Quebec produces 90% of Canadian aluminium exports
- Amount of aluminium used in cars is increasing by 5% annually

FOSTERING COLLABORATION

While the NRC Aluminium Technology Centre has been up and running for less than two years, it has already signed collaborative R&D partnerships with several local small- and medium-sized enterprises, and with industry giants such as Alcan and General Motors. The Alcan collaboration, worth $10.5 million over five years, focuses on breakthrough processes to manufacture lightweight aluminium parts for the enormous global automotive market.

NRC has also negotiated several collaborative agreements with Canadian universities to conduct groundbreaking aluminium transformation R&D. It has inked contracts with the University of Waterloo and the University of Toronto—with General Motors Canada as the industrial partner—and with the Université Laval.



"This NRC Centre is a prime example of what can be accomplished when the region pulls together to work toward a common goal. It ensures the region of the kind of environment that is conducive to aluminium transformation."

Michel Belley, Rector, UQAC

NRC'S CLUSTER PARTNERS

- Alcan Inc.
- Canada Economic Development
- General Motors Canada
- Quebec Centre for Aluminium R&D
- REGAL—regroupement université/organismes en R&D-aluminium
- SVA (Société de la vallée de l'aluminium)
- Trans-Al Network
- Université du Québec à Chicoutimi
- University of Waterloo

MILESTONES FOR COMMUNITY ENGAGEMENT

- 2000—NRC develops Aluminium Industry Technology Roadmap
- 2001—NRC commits to NRC-ATC (Aluminium Technology Centre) for Saguenay region
- 2002—NRC unveils design plans for NRC-ATC
- 2003—NRC-ATC opens doors
- 2004—Official inauguration of NRC-ATC

NRC Technology Clusters

GLOBAL REACH—LOCAL TOUCH

NRC has played a critical role in the development of emerging and mature clusters, acting as a catalyst for technological progress and economic growth in every region of Canada. Its successful clustering model encourages and supports local strengths while leveraging NRC's national and international resources, science and technology capabilities, networks and partnerships. This proven approach ensures that each cluster can develop according to its unique needs, opportunities and challenges.

Committed leadership

Successful clusters need staying power, often taking decades to mature. The building process must be community-driven and focused, and must have the support of effective networks and committed local champions.

For many years, NRC has distinguished itself as an effective catalyst for cluster development, providing not only R&D expertise, but also the leadership clusters need to move research out of the lab and put it to work for Canada's economy.

NRC stimulates the growth of world-class technology clusters, putting its leading-edge research to work in innovative communities across Canada.

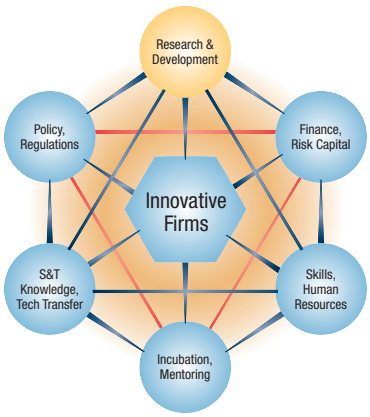
● NRC Technology Cluster Initiatives

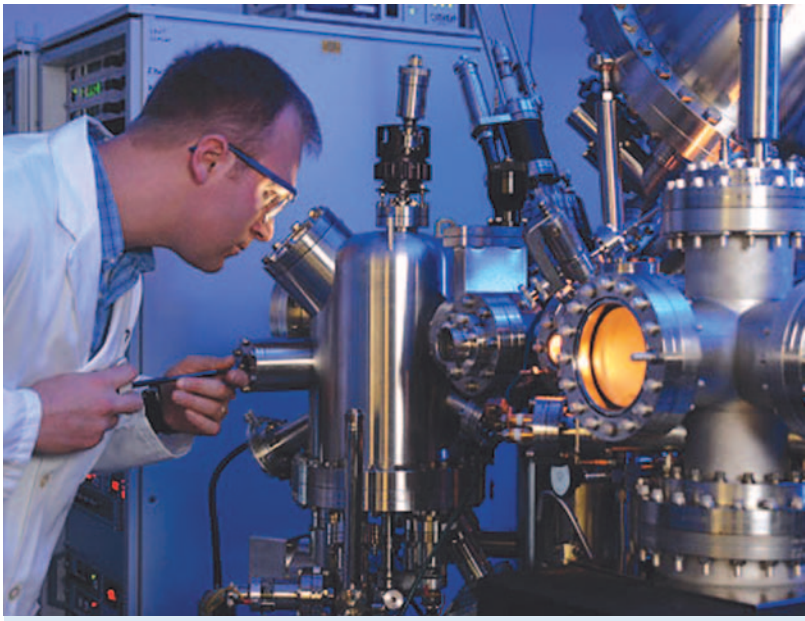
Delivering results

Clustering is a term economists have borrowed from science to describe the significant concentration of innovative companies around a nucleus of R&D facilities in a single locale—the ideal environment for innovation to flourish.

A key ingredient is the presence of a science and technology anchor—usually a government research institution or a university—able to work with local companies, transfer technology and spin off new enterprises.

Innovative, knowledge-based firms act as a magnet, attracting others with technical and business expertise to locate and invest in the area. Over time, partners grow into a critical mass of skilled people, capital and entrepreneurial drive.





GREAT PEOPLE, GREAT MINDS

Recognized globally for cutting-edge research and innovation, the National Research Council helps Canada create a world-class, knowledge-based economy. NRC is home to nearly 4,000 creative and skilled people held in highest regard by their colleagues and collaborators worldwide. NRC employees have earned international acclaim for excellence and for winning innovations – their honours include a Nobel Prize, an Academy Award, and helping Canada capture Olympic Gold.

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