

5.0 THE PLAN

5.1 Guiding Principles

The CLS is currently in a crucial phase of transition: the first years of operation were dominated by the goals to optimize all machine parameters and to establish routine operations. These goals have been achieved and with about 5000 hours of operation per year and reliability higher than 96%¹ the CLS is comparable (and in some cases better) than other third generation facilities.

The coming years will be defined by the challenges of establishing the CLS both as a world-class user facility, with more than 20 operational beamlines and a valuable partner for industry. During this time, there will be a strong focus on further optimizing beamlines and attracting more users by providing additional support, not merely by carrying out experiments, but also in the preparation of beam time proposals and in the handling and interpretation of data collected at CLS. An important objective is to grow the number of CLS users, both in terms of absolute numbers as well as attracting researchers from scientific disciplines who have not traditionally used synchrotrons.

Starting points for the development of the strategic goals of this plan were:

- The Vision and Mission statements for the CLS as approved by the Board of Directors in June 2006;
- The core values that guide the operation of the CLS;
- CLS' role in the national and international synchrotron light user community;
- Canada's Science and Technology Strategy, *Advantage Canada*, and
- A basic SWOT analysis conducted in June 2005 by CLS management

These guiding principles will be presented and discussed in more detail in the next section.

This plan was reviewed and discussed not just within the CLS but also by the Board of Directors, the CLS Users Advisory Committee (UAC) and with international advisory groups who review the performance of the machine (Machine Advisory Committee) and the performance of the beamlines, the scientific output and priorities of the CLS (Scientific Advisory Committee).

5.2 Vision, Mission, Core Values

The starting point for the planning process was the vision and mission statements as approved by the CLS Board of Directors in 2006.

To be a global leader and a recognized centre of excellence in synchrotron science and its applications.

This vision statement underlines the CLS's dual mandate. In contrast to other synchrotron facilities in the world, CLS has the explicit task to serve not just academic users but also industrial customers.

¹ Defined as the ratio of beam time delivered without system trips or faults to total time scheduled.

Based on the vision statement, the Board of Directors formulated a mission statement for the CLS with six distinct sub items:

To develop and operate the Canadian Light Source facility to enable the user community to conduct world-leading synchrotron-based research and development.

- *Synchrotron Expertise: We work with the Canadian and international scientific communities to enhance expertise in synchrotron science and promote the utilization of synchrotron light.*
- *CLS Research and Development: We conduct competitive research and development to keep the Canadian Light Source at the forefront of synchrotron science.*
- *Industrial Competitiveness: We promote industrial involvement and partnerships that support commercialization opportunities and economic development.*
- *Innovation: We provide a collaborative multidisciplinary environment that fosters innovation.*
- *Outreach: We participate actively in educational, social and cultural development of our communities.*
- *International Cooperation: We collaborate internationally and foster the exchange of people and ideas.*

This mission statement, as it was formulated for the CLS, is significantly different from those of comparable synchrotron facilities as it strongly emphasizes the role of the CLS as a partner and/or service provider to industry. Because of this fact, the CLS is the only synchrotron facility in the world that has special departments for business development and for collaboration with industrial clients (see Appendix G: Organizational Chart). In addition, the assignment of up to 25% of the available beam time at all beamlines to the Industrial Group is a feature unique to the CLS. Both approaches have shown to be very successful as the CLS is already a leading facility for applied/industrial research. The CLS is providing roughly twice as much beam time for industry as any other synchrotron -- close to 10% of the available beam time.

As a third starting point for developing our specific strategic goals, a set of Core Values was formulated.

Operation of the CLS is guided by core values of:

- *Scientific integrity and excellence*
- *Respect, equity and balance in the workplace*
- *User friendliness and teamwork*
- *Safe working environment*
- *Public accountability*

5.3 Planning Environment

A strategic plan requires a detailed and thoughtful analysis of the environment in which the institution operates, internally and externally. Specifically, consideration was given to the international synchrotron community and the CLS's role within it, as well as the national, provincial and local landscapes, and market conditions.

5.3.1 The International Synchrotron Community

When the Canadian Light Source became operational in 2004, it joined an elite group of 47 synchrotron facilities globally, with 10 in the Americas, 21 in Asia and 16 in Europe. It is known as a pioneer in advanced accelerator design and operations with many of the CLS features being used in new synchrotrons in California and Taiwan, as well as in newly proposed machines. The design of the CLS is the most compact of new medium energy, third generation facilities, the most cost effective to build, and now the most cost effective to operate.

The international synchrotron community is known for its collegiality and cooperativeness. The CLS is signatory to letters of intent, agreements and memoranda of understanding with light sources and government laboratories located in the United States, United Kingdom, France, Australia, Italy, Spain, Brazil, Russia, India and Taiwan. CLS staff members are actively involved in international collaborations, including serving on advisory committees of foreign facilities, providing technical expertise, planning and hosting conferences, and serving in outreach and information groups such as lightsources.org.

5.3.2 Canadian Science and Technology Policy Priorities

As was already discussed in some detail, the CLS' scientific programs are directly relevant to, and supportive of, the Canadian scientific research strengths and priorities laid out in the Government's Science and Technology Strategy, *Advantage Canada*. This includes providing the tools and expertise required to develop new knowledge and processes in the research areas identified by *Advantage Canada* as the country's strengths: environmental science and technology, natural resources and energy, health and related life sciences, and information and communications technology. The CLS also supports the strengthening of the knowledge, people and entrepreneurial advantages identified by the Strategy.

5.3.3 The Canadian Synchrotron Research Community

The experimental facilities at the CLS have been developed to meet the requirements of Canada's research community. Corresponding projects are lead by teams of researchers from university and government research institutions from across the country. These collaborative teams, along with additional support from universities and research organizations, have created cutting-edge research tools, including some that are globally unique in their capabilities.

All of the scientific programs at the CLS are driven by the principle of excellence in science. A peer review process ensures that innovative scientific resources are available to academic and government researchers, regardless of institution affiliation or nationality. Like Canadian society, CLS is a 'melting pot' of researchers, creating multidisciplinary opportunities that span the spectrum of the basic and applied sciences, from physics, chemistry, biology and life sciences, to protein crystallography and genomics, environmental and earth sciences, material characterization and medicine.

As a user facility, the CLS must be responsive to the needs of our current user community while growing the numbers of academic and industrial researchers who utilize the resources available at the CLS. 'End of run' reports that are submitted by users at the conclusion of their research time have been overwhelmingly positive (90%) in their feedback.

5.3.4 Market Attitudes and Perceptions

Knowledge of the CLS and its capabilities continues to grow within industry, particularly in the sectors targeted by the CLS business development and industrial science groups. Industrial engagement often occurs over a timeframe of 18 months to two years, particularly when introducing companies that have not previously utilized synchrotron techniques. Thus, engagement strategies initially involve education and perception-building including case studies, publication of results from CLS industrial collaborations in the scientific literature, participation in trade shows and organizing sessions at scientific and industrial-sector conferences. The facility's unique industrial mandate and fee-for-service structure, along with a team of dedicated industrial staff scientists provides the CLS with a strategic advantage when attracting industrial clients.

5.3.5 Public Attitudes and Perceptions

The public attitude towards the Canadian Light Source is very positive, especially in Saskatoon and area. Public perception is also considered to be positive provincially and nationally, although a lack of familiarity with the facility outside of Saskatchewan remains an issue that needs to be continually addressed.

The attitude of the Canadian public towards scientific research and development is extremely positive. A survey conducted in 2004 by Leger Marketing found that the Canadian public is very interested in learning about science and technology developments via the media. A poll conducted by EKOS Research found that 9 in 10 Canadians believe that scientific research and innovation "improve Canada's economic prospects, help keep people in Canada and develop a skilled and adaptable workforce. Canadians also acknowledge the role of science and research in sustainable communities, international influence and leadership and producing a more informed and engaged public."

5.3.6 Challenges

Several challenges must be contended with for the CLS to reach its full potential during this planning period. These include:

- National Framework for funding major scientific facilities: Currently there exists no single agency or process that can be accessed to provide full and stable funding for the operation of a number of major Canadian science facilities, including the CLS. The requirement for the CLS to fund its operations from a number of sources, each with their own processes, consumes a tremendous amount of staff resources while also creating uncertainty among staff, users and current and potential customers.
- Capital funding for support infrastructure: While CFI and matching funders provide funding for beamlines, other means of securing capital funding for support infrastructure, such as additions to the building, must be sought.
- Staff retention and attraction: Encouraging prospective staff to relocate to Saskatoon and then ensure conditions are ideally suited to encourage staff members to choose to stay once they are here.

- Human resources: A limiting factor on the timely development and efficient operations of beamlines, which is directly connected to the available operational budget, is a shortage of established positions. Currently, most beamlines in the facility are staffed by a senior beamline scientist, one research associate, and supported by shared professionals and technicians in engineering, instrumentation and information technology. Most similar facilities have twice the staff assigned to beamlines.
- Internal communications: There is a continuing need for more effective communications between senior management and staff, as well as among departments across the entire facility. Communications currently are largely confined to 'silos,' with information trickling down by varying degrees from directors and departmental managers to staff.
- Building the national user base and positioning the CLS as a national science facility.

5.4 Development, Implementation and Review Processes

The Executive Directors and/or his delegates will conduct the overall monitoring function for the execution of this plan. Monitoring will consist of regular communications with management including requesting status updates on those action items identified as priorities for a specific sector within that quarter/year.

The following timetable shows the development of the strategic plan and will guide its implementation and measurement. Key to the development and implementation of this plan is consistent, inclusive, and continuous consultation, information, and collaboration with internal and key external stakeholders.

By end of	Action	Lead/ Remarks
Spring and Summer 2009	Executive and Board of Directors discussions	Board/Executive Director
October 2009	- Staff consultations - Users and community consultations - External Committee consultations	Executive Director Directors
November 2009	Review by Board Executive Committee	Executive Director
December 2009	Review by CLSI Board of Directors	Executive Director
January 2010	Presentation to all staff/ endorsement by CLS leadership	Executive Director presents overall plan and goals to staff
February 2010	Departmental roll-out and implementation start	Directors present relevant sections of plan to staff
March 2010	End of Quarter 4 review	Managers/Directors

By end of	Action	Lead/ Remarks
June 2010	<ul style="list-style-type: none"> - Begin collecting staff feedback on plan implementation to date - Link strategic deliverables with performance appraisal objectives for next fiscal year - End of Quarter 1 review 	Directors
July 2010	Begin measuring deliverables achieved to date	Directors
September 2010	<ul style="list-style-type: none"> - Begin revision of 2011-2013 plan incorporating impact of results achieved - End of Quarter 2 review 	Directors
October 2010	<ul style="list-style-type: none"> - Collect stakeholder feedback (staff/ external advisory committees) - Incorporate stakeholder feedback into revisions 	Directors
December 2010	<ul style="list-style-type: none"> - Development of 2011 – 2013 revised plan - End of Quarter 3 review 	Directors
January 2011	Present revised plan for Board Executive Committee review	Executive Director
February 2011	Presentation of plan to CLSI Board of Directors	Executive Director

Table 5: *Development, Implementation and Measurement of Strategic Plan*

The process as described in *Table 5* will also take place for the following years.