

1. Be a Global Centre of Excellence in Synchrotron-Enabled Research and Innovation

The Canadian Light Source is at the leading edge of third generation medium-energy synchrotrons. All beamlines have been designed to be internationally competitive, while being optimized to the CLS machine parameters. Our goal is to have some beamlines recognized as being the best in the world in their area (e.g. Spectromicroscopy and BMIT), as well as to have a full suite of powerful beamlines that are suited to the needs of the Canadian synchrotron community. For example, there are six spectroscopy-focused beamlines that deliver intense, fully tunable beams of photons starting from the far-infrared and extending to the upper energy limit for X-rays available from a 2.9 GeV synchrotron (Far-IR, Mid-IR, VLS-PGM, SGM, SXRMB and HXMA). The success of two early hard X-ray beamlines (CMCF and HXMA) led the way to even more advanced suites of beamlines in this range (BMIT, Bio-XAS and Brockhouse) for imaging, spectroscopy and scattering experiments.

Together, the CLS beamlines support three pillars of research: Materials & Molecular Science, Earth & Environmental Science and Life Science. Having the advantage of being a relatively small facility, the CLS strives to be more than just the sum of individual beamlines, but rather an innovative solution provider.

1.1 Optimize Use of the Facility and Maximize Scientific Outcomes and Outputs

A key objective is to realize maximum value for the significant investment that has been made at the CLS. For this, we need to ensure the use of existing beamlines at full capacity. Beyond that, new beamlines and beamline upgrade projects have been approved through the rigorous CFI process, and CLS must deliver those projects efficiently.

1. Phase I beamlines are operational and several Phase II beamlines are open to users through the peer-review process. Most beamlines have quickly become fully utilized and some beamlines are producing a level of outputs (e.g. publications) that would be expected from a mature facility. CLS will identify and obtain additional resources for the best and most productive Phase I beamlines, to ensure the highest quality outputs and outcomes. At the same time, CLS will identify reasonable investments that can be made to make each beamline successful.

Deliverables/Milestones:

- Full utilization of Phase I beamlines
 - More than 100 publications in 2010
2. Actively promote the facility to potential users from across the country and lower barriers to access (i.e. distance and inexperience). Compared with travel to synchrotron light facilities in the U.S. for example, travel to Saskatoon can be extremely expensive and thus create a barrier for potential CLS users.

Deliverables/Milestones:

- Outreach program targeted at Canadian universities and government laboratories
 - Travel grant program for users, with priority for graduate students
 - Mentorship program to aid inexperienced users
3. Continue to place a high priority on completing and commissioning all Phase II beamlines, which is the single most significant means of enhancing outputs in the 1-2 year time period.

Deliverables/Milestones:

- All Phase II beamlines included in 2010 Calls for Proposals
 - Phase II commissioning process completed
4. Prepare aggressive but realistic schedules for new CFI-funded beamlines (Phase III) and Phase IV upgrades. Bringing these projects online quickly is the single most significant means of enhancing outputs in the 3-5 year time period.

Deliverables/Milestones:

- Plans and schedules for Phase III, IDEAS and Phase IV beamlines
5. In order to remain competitive internationally, the CLS cannot remain static. Minor improvements must be made continually within the scope of individual beamline operating budgets. More significant improvements are planned within the scope of our capital budget.

Deliverables/Milestones:

- Minor beamline improvements through an allocation of \$50k/year per beamline
- Capital expenditures totalling \$2M/year for upgrades of experimental facilities (details provided in the Capital Plan)
- Improvements to the facility focused on user needs, and identified through feedback and ongoing consultation with users. Examples include user laboratory space (Life Sciences Lab) and a small animal preparation lab.
- Improvements to beamline performance and capabilities: focused on keeping beamlines in a state of readiness that is competitive internationally. This includes fixing problems that have been identified (such as the active optics system for Far-IR) and improving performance with new technologies (new detectors for various beamlines and the on-axis visualization system for CMCF).
- Major investments that have been approved by the Scientific Advisory Committee (SAC) and the CLSI Board of Directors, such as the IDEAS beamline.

6. Phase I beamlines will prepare for the next round of the CFI Leading Edge Fund (LEF) competition. Beamlines that will likely submit upgrade proposals are SM and CMCF, with endstation enhancements a probable priority. Other eligible beamlines include HMXA, Far-IR and Mid-IR. These upgrades do not add significantly to the operating cost of the CLS. The main difficulty with these proposals will be the availability of matching funds, an inherent difficulty with all CFI proposals.

Deliverables/Milestones:

- One or two CFI beamline upgrade proposals in the next CFI LEF competition

7. Continue to hold targeted meetings, such as the recent PEEM and Brockhouse workshops, to assist in beamline planning and to ensure engagement from targeted user communities. Workshops will be organized to plan for the next round of the CFI New Initiatives Fund competition.

Deliverables/Milestones:

- Two community-building workshops in 2010

1.2 Be Responsive to the User Community

The user community created the Canadian Light Source and serving its needs is our top priority.

1. Continue to support the user feedback system (recently updated) with its high rate of participation. Hold monthly meetings with the Experimental Facility Group, the Users' Advisory Committee and CLS Managers to take action on feedback, and maintain the database of actions taken and outstanding issues.

Deliverables/Milestones:

- 10 End-of- Run discussions per year, with semi-annual reporting of results to the Board and the SAC
- Based on user feedback, commit \$250k/yr to improve user amenities

2. Providing a high level of user support requires staff.

To quote from the Fall 2008 SAC Report:

"The SAC was told that there are 140 personnel on site. However, only 2 staff members are available per beamline (an inhumane situation for full-capacity 24/7 operation), so more staff must be added (up to a total of ~200) for full support of beamlines."

The report from the NSERC MRS Mid-Term Review echoed this recommendation:

"It is vital that the CLS receive adequate resources in the immediate future to hire additional personnel for optimal beamline operation."

The CLS now has the operational budget to hire up to 200 staff by 2013.

Deliverables/Milestones:

- With a projected growth to 21 beamlines, a target should be set of having 70 staff available to provide user support. This would be an average of 3 staff per beamline (only a 50% increase from the original level), and would still be only 35% of total CLS staff. Some progress has already been made with the help of joint hires with the user community, selected additional positions where required, and the approval of full-time floor coordinator positions.

3. Assist the Users' Advisory Committee (UAC) to meet on a monthly basis (with participation from the CLS Director of Research and a Staff Scientist in the role of UAC Representative) and twice yearly in a face-to-face format (with broad participation from CLS). One face-to-face meeting should coincide with a SAC meeting.

Deliverables/Milestones:

- UAC Meeting Notes, which are posted on the CLS website. Two of the monthly meetings will be in a face-to-face format
- Supported by UAC feedback, implement a system of full-time floor coordinators to improve user support

4. Assist the UAC in holding an Annual Users' Meeting (AUM), including one day of focused workshops and one day of Beamline Information Sessions.

Deliverables/Milestones:

- AUM with Workshops and Beamline Information Sessions

5. In order to prepare the next generation of synchrotron users, hold the annual Saskatoon Synchrotron Summer School. Future expansion of the summer school may include obtaining graduate accreditation for an expanded school.

Deliverables/Milestones:

- Yearly Saskatoon Synchrotron Summer School

6. Inform and consult with the Beamline Advisory Committee (BAC). Not only does this group represent some of our most important partners and stakeholders, but they are also some of the most experienced synchrotron users at the CLS. They can play an important role in building the user community and mentoring new users.

Deliverables/Milestones:

- Monthly BAC Meeting Notes
- Plan for growing the user community

1.3 Develop an Active, Visible and Successful In-House Research Program

To be a great user facility, the CLS must be able to recruit and retain the best scientific staff. However, the CLS is more than just a user facility. Our partners value both our unique facilities and the expertise of our people. As a national facility, we have the opportunity to be leaders, taking on grand scientific challenges of great importance to society. For all of the above, we need a fraction of our resources to be devoted to an in-house research program.

1. Expand CLS funding for the trial in-house research grants started in 2009, and use this as a seed program to develop recognized areas of CLS research pre-eminence.

Deliverables/Milestones:

- Second round of in-house research grants early in 2010

2. Raise the research profile of CLS scientists, and create more opportunities for funding and career growth.

Deliverables/Milestones:

- Stipends for CLS-supervised graduate students
- Adjunct and joint faculty positions for CLS scientists

1.4 Maintain Accountability through Consultation, Dissemination of Results and Periodic External Reviews

Public Accountability is a core value of the CLS. The Experimental Facility Group is responsible for measuring scientific performance and for ensuring that scientific results are disseminated. The Scientific Advisory Committee regularly analyses our performance measures, and we are held accountable by the Board and primary stakeholders such as NSERC.

1. Maintain and enhance the detailed database of CLS utilization and publications.

Deliverables/Milestones:

- Report publications and usage statistics to SAC each May, followed by reporting to Board of Directors

2. In collaboration with the CLS Communications Coordinator, prepare and disseminate regular science highlights, as well as 'people-focused' stories as an augment to statistics on HQP training. Prepare an annual Activity Report based on user-submitted science reports and arrange for feature articles in appropriate publications (*Synchrotron Radiation News, Physics in Canada, Canadian Chemical News*)

Deliverables/Milestones:

- Monthly Science Highlights
 - Annual Activity Report
 - Press Articles
3. Continue semi-annual meetings with the Scientific Advisory Committee, which include strategic scientific planning.

Deliverables/Milestones:

- Semi-annual SAC Reports
4. Prepare for the NSERC Mid-term Review in 2011.

Deliverables/Milestones:

- Mid-Term Review in 2011

1.5 Improve and Strengthen Interaction with Universities

CLS has been the recipient of tremendous support from universities, as well as from national and provincial laboratories from across Canada, with the provision of 'in-kind' contributions of scientific expertise for the design of experimental facilities. The beamline teams that operate each facility are comprised of scientists who provide their expertise and advice to CLS on matters related to development, maintenance and enhancements to ensure that each facility is operated as a state-of-the-art resource. Several scientists from other institutions have contributed by building and making available various critical pieces of analytical equipment at CLS. These experts work with the CLS user community to ensure the safe operation and advancement of research utilizing the equipment.

Several collaborative projects with universities funded by CANARIE (a federal agency for the development of new applications for the Canadian very high-speed fibre-optic networks) have been undertaken to develop state-of-the-art user interfaces with experimental facilities at CLS. These projects utilize a high-speed, dedicated networking capability which allows for the operation of experiments from any location in the world.

1. Engage key universities across Canada to encourage integration of CLS into their research strategies and participation in CLS-related collaborations.

Deliverables/Milestones:

- Conduct meetings with VP's of Research from various Universities to ensure that CLS becomes an important part of their research strategy. This will facilitate other universities' capacity to:

- Obtain provincial support for the CLS
- Support CFI projects and other collaborations led by principal investigators at those universities
- Enhance support for Research Chairs at those universities conducting synchrotron research to 'build' the user base
- Support existing synchrotron researchers at these universities
- Organize/participate in seminars and workshops – CLS and university researchers