Recharging our workforce

A Strategic Framework For Industry Action

FINAL REPORT

electricity SECTOR COUNCIL

Building bright futures

brightfutures.ca

About the Electricity Sector Council

Approximately 100,000 Canadians are involved in the generation, transmission and distribution of one of our country's essential utilities: electricity. Their work powers homes and businesses across the country, fuelling everything from light bulbs, mobile phones and refrigerators to water treatment plants and automotive assembly lines.

The Electricity Sector Council provides support to this dedicated team by working with industry employers and other stakeholders to research and resolve human resource and workplace development issues.

For more information, contact:

Electricity Sector Council
600–130 Slater Street
Ottawa, Ontario K1P 6E2

Tel.: 613-235-5540
Fax: 613-235-6922
info@brightfutures.ca

www.brightfutures.ca

This report is available in French and can be obtained electronically at www.brightfutures.ca.

This project was funded by the Government of Canada's Sector Council Program

Canada

Table of Contents

Executive Summary **2**

1 Introduction **3**

1.1 Current State of the Canadian Electricity Sector 3

1.2 Background on the ESC's Training and Learning Development Project 4

1.3 Training and Learning Development Project Methodology 4

1.3.1 LITERATURE REVIEW OF TRAINING CAPACITY BEST PRACTICES IN CANADIAN INDUSTRY 5

1.3.2 TRAINING PROFILES 5

1.3.3 ESC TRAINING METRICS SURVEY 5

1.3.4 ONLINE INDUSTRY FORUM 5

1.3.5 TRAINING CAPACITY STRATEGIC FRAMEWORK FOR INDUSTRY ACTION 6

2 Best Practice Research **7**

2.1 Best Practice Framework 7

2.2 Industry Best Practices for Training 9

2.2.1 SECTOR COUNCIL APPROACHES TO EMPLOYEE TRAINING 9

2.2.2 ORGANIZATIONAL APPROACHES TO EMPLOYEE TRAINING 11

3 Current State of Internal Training **13**

3.1 Internal Training within the Electrical Utilities 13

3.1.1 THE INTERNAL TRAINING FUNCTION 13

3.1.2 QUALIFICATIONS OF TRAINERS 15

3.1.3 TRAINING CONTENT AND TRAINING DELIVERY 16

3.2 Internal Training within the Solar Energy Industry 17

3.2.1 THE INTERNAL TRAINING FUNCTION 17

3.2.2 QUALIFICATIONS OF TRAINERS 18

3.2.3 TRAINING CONTENT AND TRAINING DELIVERY 18

4 Strategies for Internal Training Capacity Management **19**

4.1 Challenges and Barriers to Enhancing Internal Training Capacity 19

4.2 Strategies for Enhancing Internal Training Capacity 20

4.2.1 DEVELOPING PARTNERSHIPS 20

4.2.2 UTILIZING COMPETENCY-BASED TRAINING AND ASSESSMENT APPROACHES 21

4.2.3 FACILITATING KNOWLEDGE MANAGEMENT AND TRANSFER 22

4.2.4 DEVELOPING SYSTEMS TO MANAGE THE TRAINING FUNCTION 23

4.2.5 UTILIZING VARIOUS TRAINING METHODOLOGIES 24

4.2.6 EVALUATING THE EFFECTIVENESS AND IMPACT OF TRAINING 25

5 Recommendations for Next Steps by the Electricity Sector Council **26**

5.1 Highest-Priority Recommendations for Implementation 26

5.2 Further Recommendations for Implementation 27

Acknowledgements **29**

Executive Summary

Facing an expected retirement rate of close to 30 percent of its workforce between 2007 and 2012, the electricity industry is challenged to find ways to significantly increase its training capacity to meet the training demands at all levels of organizations that this expected exodus of employees will create. As a result, the Electricity Sector Council has undertaken extensive research of training practices both within the electricity industry and in other sectors in order to inform the creation of strategic recommendations for increasing training capacity within the electricity sector. The project included the following components:

- A literature review identifying exemplary training practices in Canadian industry as a whole. These practices provided a road map of the potential strategies the electricity industry could consider to address the same staffing challenges other industries have faced.
- Profiles were developed of current exemplary practices in training within the electricity sector. These profiles provide organizations within the industry with information and guidance to take into account when considering the training strategies to implement within their own organizations.
- A survey of training managers and directors was conducted to capture the current state of training within the electricity sector. In particular, the survey emphasized the challenges and barriers to improving internal training capacity.
- A presentation of strategies for managing internal training capacity. These strategies highlight practical and tactical initiatives, processes and methodologies that can be developed and implemented at an organizational level to manage, maintain and, as required, enhance training capacity in the midst of workforce changes.
- Development of recommendations for next steps for the Electricity Sector Council. These recommendations provided suggestions for initiatives that could be undertaken by the Council to support initiatives to manage internal training capacity within the industry.
- A prioritization of the recommendations to provide the Electricity Sector Council with industry-informed guidance as to which recommendations should receive the highest priority for implementation.

1 Introduction

Created in 2005, the Electricity Sector Council works on behalf of Canadian industry to ensure that various sectors have the required number of skilled employees and professionals to meet industry needs. In particular, the Council works to ensure that employees and professionals working in the electricity sector have access to the resources they need to develop and maintain their skills through gainful employment.

As a national, independent, not-for-profit organization supported by the Government of Canada and industry stakeholders, the ESC provides essential support for employers and more than 105,000 employees within the Canadian electricity industry. The ESC plays a foundational role in fostering a commitment to skills development, business excellence and operating efficiency in the electricity sector.

1.1 Current State of the Canadian Electricity Sector

The ESC's *Powering Up the Future: 2008 Labour Market Information Study* provides the most current information regarding the overall status of the Canadian electricity sector. Both the full report and the summary report can be accessed on the ESC website at www.brightfutures.ca/lmi/en/reference.html.

According to the 2008 study, almost 30 percent of the current electricity workforce (28.8%) is expected to retire between 2007 and 2012. Most affected will be the transmission business line, which will experience an increase of 900% in retirements by 2012. As a whole, the electricity sector will experience a 160 percent increase in retirements by 2012 (*Powering Up the Future, Summary Report*, page 3).

As the workforce continues to age, the sector is faced with the challenge of filling vacancies by drawing on an ever-narrowing pool of younger workers. While research indicates the majority of the electrical workforce is between the ages of 25–54, the share of total employment by this age cohort has been steadily declining: from 94% in 1997, to 81% in 2007. During this same period, the number of workers aged 55 years and older increased from 4,100 to 13,800, while the number of workers aged 15–24 years increased from 1,600 to 6,200.

As of 2007, 26% of the workforce was between 35–44 years of age, 55% was 45 years of age and older, while 13% of the electrical workforce was 55 years of age and older (*Powering Up the Future, Full Report,* pages 53–56). Given these numbers, it can be expected that the sector will experience a significant increase in the number of retirements over the next five years. This is particularly worrisome, since employers reported in 2008 they are already facing a 3.3% vacancy rate for non-support occupations—a rate that will only be heightened by the anticipated 164% increase in retirements in non-support occupations in 2012 (*Powering Up the Future, Summary Report*, page 29).

The transmission business line reportedly has the highest proportion of employees between the ages of 45–54 years. Research indicates that less-established or less-traditional lines of business, including renewable energies, have a larger proportion of employees under the age of 44 compared with more established lines of business such as generation (excluding renewable energies), distribution and integrated (*Powering Up the Future, Full Report,* page 57).

Based on the data, the electricity sector is faced with the impending loss of highly qualified workers, compounded by a shortage of skilled new workers to fill those gaps. Research indicates that universities are experiencing a decrease in enrolment in electrical programs; however, community colleges report they have seen significant growth in enrolment in electricity-related programs and the number of registrants in electrical apprenticeship-training programs increased by 6% between 2003 and 2005, including an increase of 21% for training programs for power-line technicians (*Powering Up the Future, Summary Report*, pages 4–6).

However, despite the increase in enrolments in community college and apprenticeship programs, research also indicates there can be a lag of up to five years between training and when a worker can be considered competent or proficient in their position. This lag can be attributed to the importance of on-the-job learning that is required for many electrical occupations (*Powering Up the Future, Summary Report,* page 27).

The electricity sector currently invests approximately six times the national average in employee training compared with other industries. Training is either delivered through in-house processes and training systems, or through partnerships with educational organizations. However, despite this high investment in training, the anticipated high intake of new employees—coupled with the need for learning and development of existing employees within the sector—is expected to potentially strain the training capacity and capability of industry organizations, driving the need for training and learning to a more critical level within the sector.

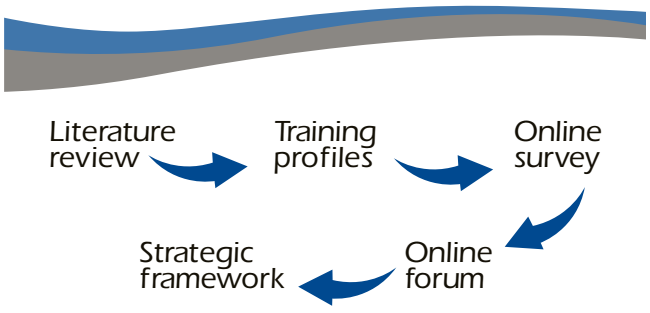
1.2 Background on the ESC's Training and Learning Development Project

The Electricity Sector Council's 2008 *Powering Up the Future* labour market information (LMI) study indicates that, by 2012, approximately 30 percent of the total workforce will be lost due to the retirements of highly seasoned and knowledgeable employees. As a result, the industry will also experience a high intake of new employees within the next three to five years, employees who will require training and development to fill the workforce gaps. Within the electricity industry, employers handle the primary training function internally. Training is typically provided in-house through custom systems or through partnerships with third-party educational organizations. While the industry already invests approximately six times the national average in training, the anticipated influx of new employees, paired with existing employees progressing into more senior roles, will only increase the need for additional investment in training to increase capacity and capability.

The Training and Learning Development Project addresses the impending increased need and demand for internal training and provides insights and strategies on the development and improvement of internal training capacity within electrical organizations across the country. The outcomes of this project will help to ensure the industry is prepared and equipped to meet these training and development needs.

1.3 Training and Learning Development Project Methodology

The Training and Learning Development (TLD) Project was conducted by utilizing a variety of primary and secondary research techniques. The development stages of the project are outlined below.



1.3.1 LITERATURE REVIEW OF TRAINING CAPACITY BEST PRACTICES IN CANADIAN INDUSTRY

The project commenced with a literature review of training capacity best practices that provides a snapshot of the current training landscape within Canadian industry as a whole. Examining the internal training methods and approaches being used by other Canadian industries and sectors serves as a beneficial foundation as the electricity and renewable sector moves forward in addressing the same labour shortages and training needs being faced by other industries across the country. More specifically, the findings of this literature review informed the criteria for the selection and development of six training profiles from within the electricity sector (which will be described in more detail below).

To find exemplary training models within Canadian industry, the research team utilized secondary research methodologies, including comprehensive and customized electronic library database and Internet searches to obtain case studies, existing research, literature and articles pertaining to successful approaches to training within industry as a whole.

1.3.2 TRAINING PROFILES

While the literature review provided a snapshot of training-capacity management and training approaches within Canadian industry, the training profiles developed for the Training and Learning Development Project provide current and detailed descriptions of training methods and approaches being used within the Canadian electricity sector to maintain and improve internal training capacity. The profiles provide training directors, managers and instructors/trainers within the electricity and renewable energy sectors with a foundation upon which to gain further knowledge and direction on various approaches to training that can be implemented within their own organizations.

To develop the training profiles, training representatives from 12 utilities and training organizations from across the country were interviewed via telephone to discuss their organizational approaches to training development, delivery and management. The information gathered within the interviews was used to develop organization-specific case studies under the following topic headings:

~ Competency-based training and assessment

~ Knowledge building, capture and transfer

~ Training evaluation

~ Training analysis

~ Apprenticeship models

~ Training methodologies

1.3.3 ESC TRAINING METRICS SURVEY

The purpose of the training metrics survey was to collect information from training managers and directors regarding trainer qualifications and training capacity management within their organizations. The results of the survey were analyzed, together with other primary and secondary research to help inform this framework. A total of 13 utilities and three solar energy organizations completed the survey.

1.3.4 ONLINE INDUSTRY FORUM

The goal of the online industry forum would be to create a practical platform to allow training organizations, including educational institutions, union training centres and internal industry training functions, to network and build working relationships toward the overall purpose of ensuring the electricity industry is prepared and equipped to handle the workforce training and development needs created by impending retirements.

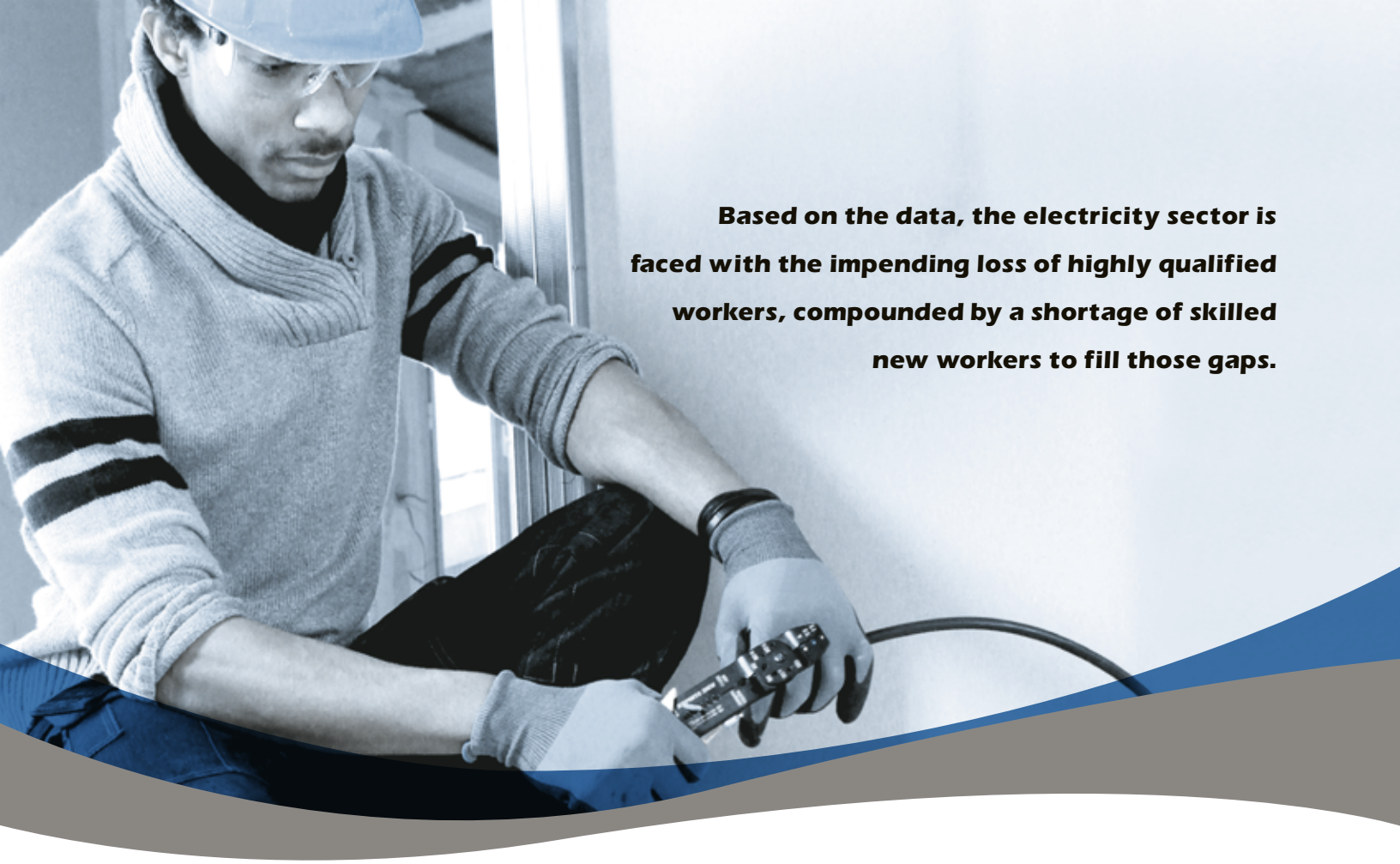
The major components of the industry forum are:

~ A website housing the research information and outputs of the Training Learning and Development Project.

~ An interactive online forum featuring discussion boards, live and scheduled chats, a repository of shared training curricula, user-contributed articles of interest to the training community and a password-protected section allowing organizations to offer or request training materials and competency profiles or any other items required to execute the training or development function.

The informational website is currently being developed. The interactive forum has been recommended for future development.

Online, interactive discussion and data sharing on targeted topics relevant to the training community could allow participants to engage in dialogue about training practices and methodologies. These dialogues could allow for an exchange of information about tools and techniques between organizations that would otherwise be functioning in a "silo" environment. Further, consultation with colleagues within



Based on the data, the electricity sector is faced with the impending loss of highly qualified workers, compounded by a shortage of skilled new workers to fill those gaps.

the industry allows individual trainers and curriculum designers to more effectively surmount challenges and obstacles presented during the design and delivery phases of training content.

1.3.5 TRAINING CAPACITY STRATEGIC FRAMEWORK FOR INDUSTRY ACTION

This report forms a strategic framework and is the culminating result of the Training and Learning Development Project. As a means to help ensure the industry will be prepared and equipped to meet the required workforce training and development needs of the future, this framework

- ~ outlines best practices for managing internal training capacity;
- ~ presents current approaches to internal training;
- ~ identifies practical and tactical strategies for managing training capacity within electrical organizations; and
- ~ recommends next steps for managing internal training capacity within the industry.

2 Best Practice Research

The overall goal of the secondary research conducted for the Training and Learning Development Project was to create a literature review of training capacity best practices within Canadian industry. By examining training capacity within Canadian industry as a whole, the electricity and renewable energy sectors can benefit greatly by implementing best practices that are in place in other industries and sectors across the country to address labour shortages and training needs.

2.1 Best Practice Framework

Through the research process, the research team discovered two best practice research studies that provided a credible foundation upon which to build a "best practice criteria" framework for training implementation, including:

~ *Innovative Learning Practices in Small and Medium Sized Canadian Enterprises* (2006)—A literature review completed by Winnipeg's Workplace Learning Centre/ Centre for Education and Work (CEW) that examined innovative workplace training approaches across Canada. (This publication can be ordered by contacting the CEW at www.cewca.org/free-materials.)

~ *Workplace Learning in Small and Medium-sized Enterprises* (2009)—A research study completed by the Conference Board of Canada that explored successful training and development practices within Canadian organizations (www.ccl-cca.ca/pdfs/OtherReports/CBofC-WorkplaceLearning-SME-OverviewReport.pdf).

Upon examination of these two overarching studies, the proposed "best practice criteria" for training implementation includes the following:

1. Training as Part of the Organizational Plan

Best Practice Criteria	Indicators
Company systems that support learning	~ Management commitment ~ Encourage all employees to share knowledge; learning and opportunities exist for pooled knowledge ~ Provide financial and/or non-financial support to develop individual employee learning and career plans for employees ~ Encourage employees to develop strengths and potential through both formal and informal learning ~ Help employees to develop career plans that include promotion possibilities as well as learning opportunities ~ Provide adequate time for training ~ Ensure content is current and up-to-date

Best Practice Criteria	Indicators
Presence of informal learning supports	~ Encourage coaching and/or mentoring (formal or informal) ~ Encourage and support opportunities for cross-training and cross-learning ~ Integrate training into common work practices ~ Implement a system for recognizing informal and formal learning ~ Include and support teamwork and opportunities to take part in improvements or problem-solving ~ Provide company- or industry-specific knowledge for self-paced or other informal learning on an intranet, the Internet or other medium ~ Ensure team meetings, company meetings and newsletters include assumed understandings so as to make informal learning easier
Presence of formal learning supports within the workplace	~ Provide opportunities for team problem-solving and collaboration ~ Demonstrate the value of observation, demonstration and trial and error to supervisors and managers ~ In-house training programs are based on adult education principles, including individualized approaches, respect for the adult learner and building on prior knowledge ~ Provide alternative delivery options (e.g., e-learning, classroom, on-the-job) for in-house training ~ Include peer trainers, collaborative learning or other strategies with the learners' strengths in mind ~ Use various formal and informal training methods simultaneously
Learning approaches suit the business model and organizational culture	~ Acknowledge that individuals learn in a variety of ways ~ Create a learning culture through the promotion and implementation of training
Relates workplace learning and training back to the business issues that they are trying to address	~ Evaluate training (to determine if training is addressing business needs)

2. Training as Part of Performance Management

Best Practice Criteria	Indicators
Learning activities are aligned with the needs of individual employees and current and future goals of the organization	~ Competency-based training ~ Job competencies align with organizational goals ~ Employee involvement in the design or implementation of training
Workplace learning and training linked with performance management	~ Individual learning plans are built from performance reviews

3. Training Content and Process

Best Practice Criteria	Indicators
Leverages workplace learning providers and learning/ training content that already exists in the market	~ Collaboration between management, employees and unions throughout the design and implementation of training ~ Collaboration with outside experts and government bodies to fund, develop and implement training
Recognizes the value of industry standards, credentials and certifications	~ For example, NERC, NOS, Red Seal/non-Red Seal electrical trades, apprenticeship ~ Support for national collaboration for learning ~ Alignment with national standards (where available) and promoting the development of national standards for the industry

The above criteria provide a framework for proposed best practices for training implementation within the industry, based on the research conducted. To be considered "exemplary," no one training model is expected to meet all of the above-defined criteria. Training models vary across organizations and industries to reflect the needs of employees, organizations and industry as a whole. However, when developing and implementing a training model at an organizational or industry level, a comprehensive approach is recommended. Such a comprehensive approach should involve a menu or "tool box" that includes a wide variety of supports and initiatives while allowing enough flexibility to enable users to tailor their application to specific needs and circumstances.

To help organizations fill their ideal training tool box according to employee needs and strategic organizational goals, sector councils are urged to disseminate relevant information and training-related tools to all stakeholders (Goldenberg, 2006: www.ccl-cca.ca/NR/rdonlyres/4F86830F-D201-4CAF-BA12-333B51CEB988/0/EmployerInvestmentWorkplaceLearningCCLCPRN.pdf).

2.2 Industry Best Practices for Training

Upon extensive review of industry approaches to managing training capacity, numerous themes and trends emerged. In particular, it was discovered that employee training can be spearheaded at a variety of industry levels, including sector councils (which seek to address human resource needs for various industries and sectors), organizations and unions. In addition, various methodologies, including partnerships and apprenticeships, may be utilized.

While organizational and sector council approaches to employee training are of particular interest for the Training and Learning Development Project, practices and methodologies utilized within all aspects of Canadian industry serve as an informative foundation upon which to develop practical and tactical strategies for managing internal training capacity within the electricity sector. The following sections illustrate sector-council and organizational approaches to employee training that have been extracted from the in-depth literature review completed for the Training and Learning Development Project. These examples have been extracted based on their relevance and adaptability to the electricity sector.

2.2.1 SECTOR COUNCIL APPROACHES TO EMPLOYEE TRAINING

Numerous Canadian sector councils, including the Electricity Sector Council, have embarked on developing programs, resources and strategies related to improving employee learning. The sector council initiatives analyzed fall within the following five major methodologies.

Technology-based training

"Technology-based training approaches" refers to the computer- and network-enabled transfer of skills or knowledge to employees. For example, the CARS Council developed the CARS OnDemand Internet-based training program, which is composed of training lessons presented as two-hour, video-based instruction. The lessons are supplemented with student learning

Online courses allow workers to learn at their own pace.

guides and examinations (www.cars-council.ca/ondemandIntro.aspx).

The Construction Sector Council developed an E-Learning Centre to offer an assortment of online courses, primarily related to management and safety, to workers within the construction industry. The online courses allow workers to learn at their own pace. Each course is approximately four to six hours long and concludes with an online examination. The e-learning courses are administered through local distributors within every province and territory in Canada (http://elearning.csc-ca.org/Pages/Home.aspx?lang=en).

Individualized learning

Individualized learning approaches include programs designed specifically for an individual employee based upon a review, such as a performance review or skills assessment. For example, the Canadian Automotive Repair and Service (CARS) Council launched CARSability, a web-based skills assessment tool that helps identify training gaps by assessing the worker's skills, identifying weaknesses, suggesting online training developed by the CARS Council to address these weaknesses, and matching the individual to the training required. (For more information about the program, visit the CARS Council's CARSability website at www.carsability.ca.)

A key benefit of utilizing an individualized approach to employee learning is that the training in which each worker participates is aimed at meeting his or her individual needs. Workers can learn at their own pace to further develop the skills, knowledge and abilities required to improve their performance of specific job tasks.

Mentoring

A large proportion of workplace learning occurs through mentoring and informal on-the-job training. Therefore, it is not surprising that many training strategies focus on implementing mentoring and coaching programs to support employee learning. The Electricity Sector Council developed an online coaching and mentoring tool kit to assist organizations and employees to develop their coaching skills. The tool kit can be used to enable organizations and employees to build a support network and to receive on-going guidance from more experienced employees (www.brightfutures.ca/en/projects/succession-planning.shtml).

The Construction Sector Council developed its Mentorship Program to support apprentices within the sector. The four-part program provides practical tools and models to encourage best practices for employee learning within the sector. The program consists of the following stages: Program Planning; Program Preparation; Orientation,

Training, Support and Monitoring; and Evaluation and Adjustment (www.csc-ca.org/en/products/mentorship-program).

There are challenges to implementing mentorship programs within organizations, namely an ever-decreasing supply of experienced workers to serve as mentors due to industry retirements. In addition, some workers may be hesitant to take on the role of mentor due to the time commitment. The benefits of mentoring, however, are numerous. It enhances job performance, facilitates learning on the job with guidance and increases the confidence of workers. In addition, mentoring can be a pivotal and critical step in successful succession planning within organizations.

Knowledge management

Knowledge management and transfer is of particular importance to ensure that critical knowledge and insights remain within an organization or sector in the wake of mass retirements of highly skilled and experienced workers. Many organizations in various industries have developed initiatives and programs to support knowledge capture and transfer. For example, the Electricity Sector Council recently completed the Knowledge Management and Transfer Project with the goal of identifying best practices for knowledge management and transfer within the industry, and to provide a strategic framework for the development and adoption of effective organizational knowledge transfer planning processes (www.brightfutures.ca/en/projects/knowledge-management.shtml).

The Mining Industry Human Resources Council (MiHR) developed knowledge transfer videos consisting of over 100 clips of mining supervisors, managers and executives who provide insights into the attributes of the mining sector. The videos were designed to capture knowledge within an industry that could lose up to 40 percent of its existing workforce in the next 10 years as the result of retirements. For more information about these videos, visit the MiHR website: www.acareerinmining.ca/en/onlineresources/video_gallery.asp.

Blended learning

Blended learning refers to the use of a combination of learning- and training-delivery methods within a training program or initiative. These methods may include distance learning, team training, mentoring, on-the-job training, apprenticeship training, train-the-trainer practices and classroom study. The Canadian Trucking Human Resources Council (CTHRC) developed the Earning Your Wheels program, a nationally recognized skills development and certification program for Class 1A and 3D drivers, as well as coach and instructor certification. The program consists of in-class training, behind-the-wheel training, supervised driving and workplace experience (www.cthrc.com/en/content/i-want-advance-my-career).

There are challenges associated with implementing a blended learning approach for employee learning. This includes the increased technical and technological infrastructure required to support the learning methodologies, requirements for instructors and lack of training materials and resources. However, because blended learning approaches incorporate various learning methodologies, they can help ensure the training being provided is suitable for employees with various learning styles and is adaptable to the needs and demands of the work environment.

2.2.2 ORGANIZATIONAL APPROACHES TO EMPLOYEE TRAINING

In addition to training approaches being implemented at both the industry and sector level, many Canadian organizations have implemented, and continue to implement, internal training initiatives to develop staff and retain the valuable skills and knowledge held by senior employees who will soon transition out of the workforce. In addition to the training processes being implemented by the sector councils, organizations from various Canadian industries are also utilizing the following approaches to employee training.

Comprehensive training systems

A training system is composed of numerous elements and often comprises the five processes found in the ADDIE process model: Analysis, Design, Development, Implementation and Evaluation. The cyclical nature of a system based on this model allows training to be continuously developed, implemented, enhanced and then implemented once again within an organization in response to training needs. Comprehensive organizational training systems often comprise numerous training methodologies that function together to form an overall training process.

Cisco Systems developed the Field E-Learning Connection training system that is accessible to all employees, at any time, to support employee learning. Through online

and on-demand multimedia training and development programs, Cisco offers technical skills training, management skills training and generic soft-skills training. More specifically, Cisco employees can access training through a website in which knowledge is organized based on job role, line of business and technology. The site also plans, tracks, develops and measures employee skills and knowledge. Employee questions are answered by e-mentors who can be reached by email, telephone or virtual meetings. Learning activities are followed by post-learning assessments. The organization's training function is managed centrally, yet the training content is developed in partnership with various subject matter experts. Cisco employees are encouraged and expected to contribute to the development of the E-Learning Connection curricula, along with a team of engineers, product-marketing specialists and professional content developers. Learning measures are based on leading indicators such as levels of knowledge and the competencies required for one's job. Training methodologies include video, Internet broadcasts, webinars and virtual classrooms (https://learningnetwork.cisco.com/community/connections).

Peer-assisted learning

Research into organizational approaches to employee training revealed that many organizations utilize both formal and informal processes to promote the transfer of skills and knowledge among peers and to foster employee learning. Approaches to peer-assisted learning include mentoring, coaching, job rotation and transference of accumulated knowledge and expertise through organizational intranets, learning portals and other technologies.

For example, Stratos Inc. (an environmental organization) developed the Stratos Academy and the Stratos Forum to allow employees to share knowledge. The Stratos Academy consists of quarterly, half- or full-day employee-led training sessions on content and knowledge not covered in the organization's training program. Occurring on a bi-monthly basis, the Stratos Forum allows work teams to discuss current projects, ask questions and provide feedback. (For more information, see www.eco.ca/pdf/ECO_HR_BestPractices_Report.pdf.)

Canadian Forest Products Limited piloted the Learning and Education Assisted by Peers (LEAP) program in which peer tutors are trained to lead activities in the workplace, activities that must be tailored to meet the learning goals of the participants. These activities may include topics such as leadership, communication and teamwork. Tutoring sessions are funded by the employer and conducted on company time. (For more information, see www.nald.ca/library/research/cboc/canforest/canforest.pdf.)

The challenges of peer-assisted learning are similar to those of mentoring, including the general lack of experienced employees to serve as tutors or leaders. However, benefits of peer-assisted learning include increased collaboration, team-building and improved problem-solving skills.

3 Current State of Internal Training

The training metrics survey was conducted to collect information from training managers and directors regarding trainer qualifications and the management of training capacity within their organizations. The survey was open from November 8 to December 24, 2010 and garnered responses from 13 utilities from across the country as well as three organizations within the solar energy sector. The results of the survey provided valuable insights into the qualifications of trainers, the sources of training content and the overall internal training systems within electrical organizations.

3.1 Internal Training within the Electrical Utilities

The following section provides an overview of the survey responses from the 13 utilities from across the country.

3.1.1 THE INTERNAL TRAINING FUNCTION

In the training metrics survey, respondents were asked about their current internal training function. The information collected is presented below.

Organizational training is handled primarily within human resources departments and dedicated training departments.

When questioned about which department(s) handles training within their organizations, 69.2% of respondents indicated the human resources department, 61.5% indicated the dedicated training department, 53.8% indicated the health and safety department, and 38.5% indicated the operations department. Respondents were prompted to select "all that apply," meaning that, within some organizations, different departments may handle various aspects of organizational training. For example, one respondent indicated that, within their organization, the operations department is responsible for corporate training programs, the health and safety department for legislated training, and every department is responsible for implementing appropriate technical training.

Among respondents, the average number of full-time-equivalent (FTE) employees dedicated to the organizational training function is 41; the average number of full-time-equivalent employees that deliver training is 27.

When surveyed on the average number of full-time-equivalent employees dedicated to the organizational training function (including planning, designing, developing, delivering, evaluating and supporting training), the average number of FTEs across all 13 organizations was 41. However, it is critical to take into consideration the total number of employees within the various organizations, which ranged from 600 to 8,000.

	1	2	3	4	5	6	7	8	9	10	11	12	13	Avg.
Number of Employees	600	600	650	1,700	1,700	1,800	2,500	2,500	2,700	6,000	6,200	8,000	8,000	**3,304**
Number of training-related FTEs	1.5	6	1.5	8	9	2	13.5	10	12	46	30	90	300	**41**

Respondents were then asked to identify how many full-time-equivalent employees deliver training within their organizations. Once again, the number of FTEs is linked to the total number of employees. In addition, it was cited during interviews with utilities that internal trainers are often pulled from the line for a period of time to perform a training function and return back to their field job upon completion. Therefore, one cannot assume that, even if an organization indicates zero training-related FTEs, there are no employees involved in delivering training in some capacity within the organization.

	1	2	3	4	5	6	7	8	9	10	11	12	13	Avg.
Number of Employees	600	600	650	1,700	1,700	1,800	2,500	2,500	2,700	6,000	6,200	8,000	8,000	**3,304**
Number of training-related FTEs	0	5	Un-known	3	4	1	7	8	7	20	30	33	200	**27**

Among respondents, an average of 65% of training is conducted internally, while 35% is conducted externally.

The average number of training days per employee, per year is 8.3 days.

When asked about the number of training days per employee, the range of responses varied greatly, from 4 to 150 days. Because it is skewed by the outliers, the average (22.1 days) is artificially high. The range of responses is below.

Number of training days per employee per year						
4 days	5 days (4 respondents)	8 days	10 days	13.5 days	15 days	150 days

To validate the results, the lowest variable (4 days) and the highest variable (150 days) were removed, bringing the average number of training days per employee per year to 8.3, which is a more realistic depiction of the current trend within organizations across the country.

The majority of organizations surveyed (69.2%) have learning management systems to track skills and qualifications.

Of the organizations that are currently using learning management systems (LMS), the programs utilized range from those developed internally to off-the-shelf programs customized to meet specific needs. The types of learning management systems mentioned in survey responses included the following:

~ Internally branded Plateau LMS

~ Result on Demand by Aspen

~ Oracle

~ Utility Risk Management (URM)

~ SAP

3.1.2 QUALIFICATIONS OF TRAINERS

Throughout the training metrics survey, respondents were questioned regarding the current qualifications of trainers within their organizations. The information collected from the 13 respondents regarding the internal training function is presented below.

The majority of organizations require their trainers to have technical expertise in the trade(s) they are teaching (84.6% for internal trainers, 69.2% for external trainers), followed by training/adult education experience (76.9% for internal trainers, 61.5% for external trainers).

While technical expertise in the trade(s) and training/adult education experience were identified as requirements for both internal and external trainers, only four organizations (30.8%) currently require both their internal and external trainers to have adult education certification or credentials.

Of the organizations that do require this of their trainers, the majority of organizations (38.5% for internal trainers, 23.1% for external trainers) require a certificate in adult education.

The main role played by both internal (100.0%) and external trainers (76.9%) is that of classroom instructor.

Among respondents, the main role played by internal and external trainers is that of classroom instructor. For internal trainers, this role was closely followed by on-the-job coach (84.6%), field assessor/student evaluator (84.6%) and training designer (76.9%). For external trainers, the role of classroom instructor was most closely followed by training designer (38.5%) and facilitator within an online learning environment (23.1%).

Among organizations in which trainers are involved in the training design, the majority of both internal trainers (69.2%) and external trainers (38.5%) are involved in the design of classroom-based training. This was followed by the design of online training (38.5% of internal trainers, 23.1% of external trainers).

A slight majority of organizations surveyed (53.8%) do not require their trainers to participate in professional development.

Survey respondents indicated that professional development is often not a requirement but is recommended.

Among those respondents who indicated that professional development is a requirement for trainers within their organization (46.2%), the following information was collected:

- Trainers may be required to participate in courses on various topics including: adult learning principles, performance-based training, adult education, train-the-trainer, technical upgrading and computer skills.
- The average number of hours of professional development required per year is 39 hours. The range of responses included: 20 hours; 21 hours of skills-based training annually plus 16 hours per year of instructor-led train-the-trainer workshops; 40 hours; and 75 hours over four years.

The majority of organizations surveyed (61.5%) offer an in-house train-the-trainer program.

According to respondents, the average length of organizational train-the-trainer programs is 16.8 hours. The ranges of responses included:

2 hours	8 hours	16 hours (3 respondents)	21 hours	24 hours	Initial: 100 hours Annually: 37 hours

To validate the results, the lowest variable (2 hours) and the highest variable (100 hours) were removed, bringing the average number of training hours per employee per year to 16.8 (rather than the actual average of 25 hours), which is a more realistic depiction of the current trend within organizations across the country.

The majority of train-the-trainer programs (75.0%) are organization-specific (i.e., developed in-house) and have the following components: complete course curriculum (75.0%); instructor manual (87.5%); student manual (87.5%); practicum exercises (87.5%); PowerPoint slides (87.5%); examinations and testing materials (75.0%); adult learning principles and theories; communication techniques; and lesson-planning guides.

All organizations surveyed believe that occupational standards for trainers would be beneficial.

3.1.3 TRAINING CONTENT AND TRAINING DELIVERY

Throughout the training metrics survey, respondents were questioned regarding current training content and delivery within their organizations. The information collected from the 13 respondents is presented below.

The majority of utilities (76.9%) define the skills, knowledge and abilities that are required for workers within specific occupations (e.g., by developing skills or job profiles).

When asked for which occupations their organizations have defined the skills, knowledge and abilities for job incumbents, responses included: trades groups, civil workers, unionized positions, technicians and train-the-trainer.

Respondents were also asked to identify the primary uses of the defined skills, knowledge and abilities within their organizations. The majority of respondents indicated job descriptions and assessments and training program development.

A total of 80.0% of surveyed organizations indicated their training programs directly link to the defined skills, knowledge and abilities for workers within specific occupations.

Among respondents, an average of 65% of the training curriculum is developed in-house, while 35% is developed externally.

Among the utilities surveyed, the most commonly used evaluation level for training programs (76.9% of utilities surveyed), based on the Kirkpatrick Model for evaluating the effectiveness of training programs, is Level 1—Reaction (i.e., evaluating how training participants react to the program).

Responses regarding the evaluation of training programs within utilities varied, with 15.4% of respondents indicating they currently do not evaluate their training programs. For those conducting evaluations using levels 2–5, the responses were as follows:

- Level 2—Learning (i.e., evaluating to what extent training participants improved their skills, knowledge or changed their attitudes as a result of the training): 61.5%
- Level 3—Behaviour (i.e., evaluating to what extent training participants changed their behaviours in the workplace as a result of the training): 53.8%
- Level 4—Results (i.e., evaluating the organizational benefits that resulted from the training): 30.8%
- Level 5—Return on Investment (ROI) (i.e., comparing training benefits to costs): 15.4%

A significant majority (92.3%) of utilities work with other post-secondary training organizations to deliver employee training.

Of the 12 utilities that work with other organizations to deliver employee training, 58.3% have partnership arrangements and 41.7% indicated they have fee-for-service arrangements. Respondents indicated they work with other training organizations on an as-needed basis and they often enter into both fee-for-service and partnerships, depending on the situation and need.

A slight majority (53.8%) of utilities surveyed are currently sharing training content or curricula with other organizations; however, a strong majority of respondents (84.6%) are currently not selling training content or curricula to other organizations.

Of the training content that is currently being shared with other organizations, the majority (85.7%) share health and safety training, followed by technical training (71.4%) and leadership training (42.9%).

For those utilities that are currently selling training content or curricula to other organizations, 100.0% of them are selling technical training, 50.0% are selling health and safety training and 50.0% are selling leadership training.

3.2 Internal Training within the Solar Energy Industry

The following section provides an overview of the survey responses from the three solar energy organizations.

3.2.1 THE INTERNAL TRAINING FUNCTION

Throughout the training metrics survey, respondents were questioned regarding their current internal training function. The information collected from the three respondents is presented below.

Organizational training is typically conducted in the field or contracted to an external provider.

When questioned about which department(s) handles training within their organizations, 100.0% of respondents indicated "Other" rather than an internal department. One respondent indicated that training is conducted in the field. Another responded that they contract a training coordinator who hires trainers externally, and one respondent indicated that training is handled by their organization's marketing department.

Among respondents, the average number of full-time-equivalent employees dedicated to the organizational training function is 1.4; the average number of full-time-equivalent employees that deliver training is 2.

Across all three organizations, the average number of full-time-equivalent employees (FTEs) dedicated to the organizational training function (including planning, designing, developing, delivering, evaluating and supporting training), was 1.4. However, along with the number of FTEs, it is critical to take into consideration the total number of employees within each organization, which ranged from 4 to 24.

				Avg.
Number of employees	**6**	**4**	**24**	**11.3**
Number of training-related FTEs	**0.1**	**0.1**	**4**	**1.4**

Respondents were then asked to identify how many full-time-equivalent employees deliver training within their organizations. Once again, the number of FTEs is shown together with the total number of employees.

				Avg.
Number of employees	**6**	**4**	**24**	**11.3**
Number of training-related FTEs	**4**	**0**	**2**	**2**

Among respondents, an average of 46.7% of training is conducted internally, while 53.3% is conducted externally.

The average number of training days per employee per year is 3 days.

The range of responses to this question varied from 0 to 5 days.

None of the organizations surveyed have learning management systems (LMS) to track skills and qualifications.

3.2.2 QUALIFICATIONS OF TRAINERS

Throughout the training metrics survey, respondents from the solar energy industry were questioned regarding the current qualifications of trainers within their organizations. The information collected from the three respondents is presented below.

The majority of organizations require their trainers to have technical expertise in the trade(s) they are teaching (66.7% for internal trainers, 100.0% for external trainers), followed by training/adult education experience (33.3% for internal trainers, 66.7% for external trainers).

One respondent indicated that trainers for solar hot water installers must be certified as trainers by the Canadian Solar Industries Association (CanSIA).

Of the organizations that do require their trainers to possess adult education certification or credentials, one respondent indicated the need for a certificate, while another indicated that a diploma is required for internal trainers within their organizations. One respondent indicated that a certificate in adult education is required for external trainers.

The main role played by external trainers (100.0%) is classroom trainer. For internal trainers, 66.7% of respondents indicated their main roles are as on-the-job coach, training program evaluator, field assessor/student evaluator, and training designer.

Among organizations in which trainers are involved in training design, the majority of both internal trainers (66.7%) and external trainers (66.7%) are involved in the design of classroom-based training. This was followed by the design of online training (33.3% of internal trainers, 33.3% of external trainers).

None of the organizations surveyed have professional development requirements for their trainers.

None of the organizations surveyed offer an in-house train-the-trainer program.

A majority of surveyed organizations (66.7%) believe that occupational standards for trainers would be beneficial.

3.2.3 TRAINING CONTENT AND TRAINING DELIVERY

Throughout the training metrics survey, respondents were asked about the current training content within their organizations. The information collected from the three respondents is presented below.

The majority of organizations (66.7%) do not define the skills, knowledge and abilities required for workers within specific occupations (e.g., by developing skills or job profiles).

One organization has defined the skills, knowledge and abilities required for junior and senior installers and electricians. The organization uses the defined skills, knowledge and abilities to conduct assessments of work performance. Training is directly linked to the defined skills, knowledge and abilities for the workers within specific occupations.

Among respondents, an average of 65% of the training curriculum is developed in-house, while 35% is developed externally.

The majority of organizations (66.7%) do not currently evaluate their training programs. One organization conducts evaluations at Level 1—Reaction (i.e., they evaluate how training participants react to the program).

All organizations surveyed work with other post-secondary training organizations to deliver employee training.

A total of 66.7% of the organizations surveyed have partnership arrangements with other post-secondary training organizations and 33.3% have a fee-for-service arrangement. Respondents indicated they hire from college programs that offer job training for the industry.

None of the surveyed organizations are currently sharing or selling training content or curricula.

4 Strategies for Internal Training Capacity Management

4.1 Challenges and Barriers to Enhancing Internal Training Capacity

Within the training metrics survey, respondents were asked to asked to choose from a list of options to identify the challenges they are currently facing in maintaining or enhancing their internal training capacity. The results are presented below, together with a sampling of comments provided by survey respondents.

Staffing

Identified as a challenge by **69.2%** of survey respondents

> *"Ensuring we have the right resources to design and deliver training is a challenge."*
>
> *"The amount of required training compared to the number of learners is not ideal."*
>
> *"Dedicated resources are lacking, which can result in a lack of accountability."*
>
> *"The application of new knowledge is challenged due to minimal staff sources."*
>
> *"There is a lack of mentoring opportunities (not enough senior staff)."*

Curriculum development

Identified as a challenge by **61.5%** of survey respondents

> *"Enhancements and changes need to be made to our curriculum to support changes in technology, use of material, equipment or standards."*
>
> *"Development of refresher training is a challenge."*

Facilities

Identified as a challenge by **61.5%** of survey respondents

> *"Training peaks within our organization, so we have lots of excess facilities in slow times but can be critically short at other times."*

Obtaining qualified trainers

Identified as a challenge among **53.8%** of survey respondents

> *"We have a pool of resources we use externally to support our training needs; we always need to keep up to ensure they are meeting the standards and, internally, to ensure those who apply to be temporary trainers can train—not just do the work."*
>
> *"Instructional design requirements for trainers are a challenge. Current staff members are retiring and we are facing an inability to attract new workers due to pay and funds."*
>
> *"Obtaining qualified trainers in some programs is difficult because of a shortage of qualified incumbents. Clients often want training on short notice to qualify new staff/temporary staff/etc., and this is done sometimes at the expense of training development."*

Company focus

Identified as a challenge by **46.2%** of survey respondents

Administration of training

Identified as a challenge by **46.2%** of survey respondents

> *"We need a fully functioning learning management system to support training administration and tracking."*
>
> *"Scheduling training is always a challenge."*
>
> *"Too many initiatives being implemented at once competes with training opportunities."*

Technology advancements

Identified as a challenge by **46.2%** of survey respondents

Funding

Identified as a challenge by **31.3%** of survey respondents (both utilities and solar*)

> *"Business planning continually challenges us to do more with less. Line managers can see classroom delivery, and it is easier to fund. They don't see the development work required to have and maintain a quality program."*

*Survey respondents from the solar energy sector identified funding as the most significant challenge to training.

Aging equipment

Identified as a challenge by **23.1%** of survey respondents

Ability to obtain training content

Identified as a challenge by **18.8%** of survey respondents (both utilities and solar†)

† Survey respondents from the solar energy sector identified "ability to obtain training content" as the second-most significant challenge to training.

4.2 Strategies for Enhancing Internal Training Capacity

With the knowledge that the electricity sector will be confronted with impending retirements within the next five years (2011–2016), the proactive move is to embark on identifying practical and tactical strategies, initiatives, processes and methodologies that can be developed and implemented at an organizational level to manage, maintain and, as required, enhance training capacity in the midst of these workforce changes.

Based on the primary and secondary research conducted for the ESC Training and Learning Development Project, the following strategies are proposed to assist in enhancing internal training capacity within electricity sector organizations.

4.2.1 DEVELOPING PARTNERSHIPS

Employee training is a significant investment for all organizations but can be particularly taxing on those organizations that have fewer employees and low training budgets. However, the electricity industry—with its numerous specialized trades, health and safety demands and productivity requirements—places significant demands on all utilities, both large and small. Regardless of an organization's size, establishing partnerships for the development and delivery of employee training can be a cost-effective and mutually beneficial strategy to enhance training capacity. Partnerships come in many forms and may include the following combinations:

Utilities partnering with educational institutions

Educational institutions and training providers are often the source of new graduates from electrical post-secondary programs. By entering into a partnership with an educational institution, the utility and the institution can negotiate the terms of the partnership, which may include joint curriculum development, creation of a co-operative student work-placement program, employment of utility staff as trainers/instructors, and initiatives for hiring graduates.

Arrangements can be made to share training facilities, thus reducing infrastructure costs for both the utility and the educational institution. Further, partnerships between educational institutions and utilities can help to counteract the need for internal training and help ensure the utility is a top hiring choice among graduates, thus helping to fill workforce gaps created by retirements within the utility.

Utilities partnering with other utilities

Within the electricity sector, internal training is often developed and conducted independently. Thus, utilities in one province are totally unaware of the methodologies and systems being used by organizations within neighbouring provinces—or even neighbouring jurisdictions. For that reason, utilities could benefit greatly by seeking out partnerships to collaboratively develop and implement training programs and processes.

The nature of partnerships between utilities may differ depending on need. For example, a service-level agreement in which one utility sells training content to another on an as-needed basis may serve as an effective partnership arrangement.

If two utilities are in the process of developing training, they could work together to develop systems, content and materials that meet the mutual needs of employees within both organizations. Partnerships could also focus on sharing facilities to reduce individual infrastructure expenses. Partnerships among utilities can be particularly effective for acquiring innovative training methodologies such as simulation training. (Through partnerships, smaller utilities may be able to acquire access to licenses

to provide simulation training to their employees, something they may be unable to do as a single utility.)

Utilities partnering with unions and labour associations

Unions and labour associations often have their own training initiatives to support the learning and development of members. Developing partnerships with unions to utilize their training content within a utility setting can be very beneficial. From computer-based training modules to access to training facilities and equipment, partnerships with unions can help ensure that employees are given access to high-quality training.

4.2.2 UTILIZING COMPETENCY-BASED TRAINING AND ASSESSMENT APPROACHES

Competency-based training helps to bridge the gap between what is taught in training and what tasks will be performed on the job. Training employees to perform actual job functions helps to ensure that front-line workers have the skills, knowledge and abilities required to perform their jobs properly, safely and effectively. In addition to competency-based training, assessments based on the performance of actual work competencies helps to ensure that employees are performing their work tasks as safely as possible, that performance gaps are recognized prior to serious incidents, and that training can be implemented to improve competency.

Acquire or develop competency profiles for key occupational groups

Competency profiles outline the skills, knowledge and abilities required for job incumbents to perform their jobs safely, effectively and properly. Having a competency profile for each occupational group, job or key area can aid in the identification of training needs. Competency profiles can then form the basis of other human resource strategies, including job descriptions, performance assessments and, ultimately, training program development.

Competency profiles can be developed in a number of ways; however, one of the most effective techniques is the DACUM method (**D**eveloping **a** **C**urricul**um**). To develop a competency profile, a group of eight to 10 job incumbents with a range of experience gather together-led by a facilitator-to come to a consensus regarding the skills, knowledge and abilities required of competent workers. A number of utilities from across the country have already embarked on developing competency profiles for various trades and occupational groups, including power-line technicians and electricians.

In addition, the Electricity Sector Council has developed competency profiles for nine occupations within the electricity and renewable energies sector, including power station operator, power systems operator, wind turbine technician, project manager, electrical technician and technologist, power protection and control technician and technologist, photovoltaic installer, photovoltaic system installer, solar thermal installer, and geothermal equipment installer.

Acquire or develop competency-based training programs

Competency-based training focuses on teaching the skills, knowledge and abilities required by job incumbents. Emphasis is often placed on the performance of a skill to ensure mastery prior to the learning of subsequent skills. Competency profiles or skills profiles, as mentioned above, form the foundation for the development of competency-based training by identifying exactly what a job incumbent will be expected to do once in the field. An effective competency-based training technique is the development of learning guides or learning modules that correspond with a specific work task or skill (or cluster of similar work tasks) identified within the competency profile. Learning guides or modules give the learner the opportunity to acquire the skills for effective task performance at their own pace. Modules are typically comprised of information about the task, practice exercises, practice quizzes and performance assessments. A tiered approach using prerequisite training modules can help to ease the burden on training centres by allowing students to work through the modules at their own pace in a more self-directed format.

Assess workers' competence in the performance of work-related tasks

The development of competency profiles for trades and occupational groups provides a foundation on which competency assessments of field workers can be performed. Numerous utilities have implemented successful competency assessment programs in which trained evaluators (typically experienced field personnel) assess the performance of current workers or potential hires to assign a competence rating to specific

tasks, particularly tasks that have considerable safety risks associated with poor performance. Resulting from the evaluation is the identification of specific areas for which workers require additional training and development. Through the identification of distinct training needs based on performance assessment, the training function can be streamlined to ensure that workers are receiving the training they require for competent job performance, rather than having a whole group of workers attend training that perhaps only half truly require.

For examples of competency-based training and assessment practices in use by Canadian utilities, please see the ESC training profile: *Competency-Based Training and Assessment* (www.brightfutures.ca/TLD/english/profiles/knowledge.asp).

Assess training needs

The most effective training is that which meets a performance need or gap within an organization. Because training is costly in terms of both monetary and human resource needs, it is only logical that organizations would conduct analyses to identify training needs prior to investing time and money in developing training programs and materials that are not reflective of actual need. Effective training analysis processes help an organization to answer key questions about their internal training function, including: Who requires the training? What training is needed? When is the training required? Where will the training be conducted? How will the training will be delivered?

Identifying competencies for specific roles and reflecting those competencies in employee performance assessments helps feed an effective training analysis. Using sound methodologies and processes to obtain feedback from workers in the field provides direct insights into perceived performance gaps among workers. It also ensures that any training developed for an organization addresses needs in the field.

It is important to note than an effective training analysis considers not only identified areas of opportunity in employee development, but also considers the broader organizational goals and direction. Taking into account the current and future needs of the organization and ensuring job competencies are aligned with organizational goals is crucial. It should also be noted that training is not always the best way to try to close a particular gap between an organization's goals and its actual performance. Those conducting the needs analysis must get a clear idea of the problem, look at all possible remedies and report on their findings to management before deciding on the best solution.

Prioritize training needs

A common mistake that can be made when developing and delivering training is a focus on quantity, rather than quality, that is, trying to cover as many topic areas as possible, often at the expense of quality and depth of learning.

The results of a training-needs analysis may uncover a number of training gaps and areas that require attention. However, attempting to immediately address all of the identified gaps and needs can result in an ineffective use of time and resources that would be better spent if allocated in a more targeted way. Having a clear indication of the range of training needs within the organization informs the foundation of a training strategy. Prioritizing training needs and gaps to identify which areas require immediate attention allows for a more effective dedication of training resources and time.

The prioritization of training can be accomplished by convening a training committee comprised of all organizational stakeholders. To prioritize training needs, various factors need to be considered, including the effect that poor performance has on the safety of employees, productivity and efficiency. In other words, determining which needs pose the most risk to the employees and organization if not addressed immediately.

For examples of training analysis techniques in use by Canadian utilities, please see the ESC training profile: *Training Analysis* (www.brightfutures.ca/TLD/english/profiles/knowledge.asp).

4.2.3 FACILITATING KNOWLEDGE MANAGEMENT AND TRANSFER

As highly experienced, skilled and knowledgeable practitioners exit the workforce in the next three to five years, the importance of effective knowledge management and transfer will be paramount within the electricity sector to ensure that current practitioners have the skills, knowledge and abilities that are required to perform their roles safely, effectively and properly. There are numerous approaches to organizational knowledge management and transfer that can be implemented to suit the specific needs of one's organization. Potential strategies for knowledge management and transfer are presented below.

Develop organizational networks to promote knowledge sharing among employees

Employees with various levels of experience and expertise are highly valuable assets in the sharing of knowledge among the workforce. Developing a network of existing employees, one that represents a range of experience and expertise and that continues to grow and evolve over time, helps to ensure that employees always have resources for knowledge transfer in the form of their peers. Employees become subject matter experts who can share their expertise with others informally on an as-needed basis. These employees can also be trained to serve as internal trainers in addition to their permanent positions within the organization.

Recognizing the potential of peer learning and support for knowledge management and transfer through the development of a knowledge-sharing network can be an effective practice for organizations of all sizes and business lines.

Document critical processes

All too often, organizations recognize the extensive knowledge held by employees only after they have left the organization. In this scenario, organizations are left scrambling to piece together the information required to bring new workers into vacant positions. A proactive way to prevent knowledge loss is to formally document critical processes while the experienced workers are still in their positions. Documentation of knowledge—including technical skills required, processes to follow, nuances of the job, and even tips for success or troubleshooting—is invaluable for a workforce in transition.

Implement formal or informal mentoring processes

The learning that occurs on the job and from peers is incredibly effective and valuable. Mentoring, the process of an experienced worker providing guidance and support to a less-experienced worker, can be a very effective formal or informal practice for knowledge transfer. Mentors and mentees can work side by side and develop a trusting relationship from which both can benefit. While the mentee clearly benefits from being instilled with the knowledge and experience of their mentor, the mentor can also see their job from a different perspective: through the eyes of a new employee. Ad hoc or regularly scheduled mentoring is a highly effective and inexpensive method for knowledge transfer; however, commitment is required on the part of the mentor and the mentee for effective knowledge transfer and learning to occur.

Create an organizational KMAT plan

In recognition of the importance of knowledge management and transfer within the electrical industry, the ESC recently embarked upon the Knowledge Management and Transfer Project. The goal was to conduct extensive research to identify best practices for knowledge management and transfer within the Canadian electricity industry. The results of this project provide industry with strategic recommendations to aid in the development and adoption of effective planning processes for organizational knowledge transfer. Results of this project can be obtained from the Knowledge Management and Transfer web portal: www.brightfutures.ca/kmat.

For additional examples of knowledge management and transfer techniques in use by Canadian utilities, please see the ESC training profile: *Knowledge Building, Capture and Transfer* (www.brightfutures.ca/TLD/english/profiles/knowledge.asp).

4.2.4 DEVELOPING SYSTEMS TO MANAGE THE TRAINING FUNCTION

Regardless of the size of the organization, the internal training function is most effective when supported and managed through systems and processes. Using intuitive systems and processes to efficiently file training content, employee data, training histories and supportive materials helps to ensure the training function runs as effectively as possible, thus promoting employee learning and development.

Develop a learning management system

The notion of utilizing a learning management system (LMS) to electronically assist in administrating, documenting, tracking and reporting on internal training can be daunting. LMS is often considered a luxury that only the larger, more innovative and forward-thinking organizations are able to purchase and implement. It may the case that a significant proportion of utilities that are currently utilizing LMS to support their training function are larger in size; however, the basic principles behind the use of an LMS can be translated to organizations and utilities of any size.

The key benefit of an LMS is the ability to electronically house critical training information in one location. The LMS can be integrated with other organizational programs for the sharing of information. There are a number of open-source options available for organizations that do not have the budget to purchase highly advanced LMS software. While by no means an exhaustive list, products such as Moodle, Dokeos, ATutor, Open e-LMS, and eFront are examples of affordable options for organizations that can provide the benefits of an LMS. Prior to purchasing, all organizations should conduct research into the software available to ensure they make an informed decision regarding an LMS that will meet their specific needs.

Develop corporate training committees

Training committees comprised of all stakeholders of the internal training function are an effective means of ensuring that training is meeting identified needs. Such committees also evaluate the training function and identify areas of improvement.

Many levels of employees are affected by the internal training function, including senior management (who often provide approval for training), human resource personnel, training developers and coordinators, supervisors and managers, as well as trainees (who will vary depending on the training being delivered). It is critical that corporate training committees be able to meet on a prescribed basis throughout the training life cycle (i.e., analysis, design, development, implementation and evaluation) to discuss the training function, address concerns and improve upon the internal training function. All stakeholder groups lend differing perspectives and vantage points that are all equally important to the success of the internal training function.

4.2.5 UTILIZING VARIOUS TRAINING METHODOLOGIES

Traditionally, "training" was viewed as a classroom-based learning activity in which groups of learners were instructed or taught a particular concept from an instructor. However, the realm of organizational training has expanded with the increased awareness and acceptance of varying learning styles and different approaches to learning. While classroom-based training may remain the foundation for training, many organizations and utilities are also incorporating other learning methodologies.

Explore the potential for simulation training for technical work processes

Numerous utilities across the country are experiencing the benefits of simulation training for both the initial training of apprentices and refresher training for journeypersons. Simulation training enables the learner to perform work processes in a simulated environment, allowing for errors to be made and learning to be achieved without the serious safety implications associated with making errors in the field. Current simulation software is of top quality and allows learners to fully immerse themselves in the simulated environment.

Simulation training can seem out of reach for smaller utilities that have limited resources to devote to training. However, as the use of simulation training continues to gain momentum and interest within the industry, opportunities for partnerships for the development and licensing of simulation training programs among utilities is a viable option to allow smaller utilities the opportunity to benefit from this very useful training technology.

Explore other appropriate training methodologies

Outside the walls of a classroom await a number of possibilities for employee learning including: computer-based training modules, webinars, on-the-job training, mentoring, team exercises, job shadowing, self-directed learning modules, online training portals, internal discussion forums and internal knowledge networks. Integrating varying training methodologies allows the organization to go beyond the traditional form of learning and take advantage of the fact that learning can occur in many places, through various forms and at varying paces for individual employees.

After identifying the training needs of employees, take the time to consider the various training methodologies that could be effectively and efficiently implemented within the organization to enhance the internal training function and promote employee learning.

For examples of various training methodologies in use by Canadian utilities, please see the ESC training profile: *Training Methodologies* (www.brightfutures.ca/TLD/english/profiles/knowledge.asp).

4.2.6 EVALUATING THE EFFECTIVENESS AND IMPACT OF TRAINING

The Kirkpatrick Model for evaluating the effectiveness of training programs is a widely used method for training evaluation. When originally developed by Dr. Donald Kirkpatrick in 1959, the model consisted of four levels. Building upon Kirkpatrick's work, Dr. Jack Phillips later proposed a fifth level.

The Kirkpatrick Model allows organizations to evaluate their training function on a number of levels, with the most important levels-Level 3 upward-providing an assessment of whether the training has had a lasting effect on the trainees and the organization as a whole. The five levels of the Kirkpatrick Model are:

Level 1: Reaction	Evaluating how training participants react to the program
Level 2: Learning	Evaluating to what extent training participants improved their skills, knowledge or changed their attitudes as a result of the training
Level 3: Behaviour	Evaluating to what extent training participants changed their behaviours in the workplace as a result of the training
Level 4 : Results	Evaluating organizational benefits that resulted from the training
Level 5: Return on Investment (ROI)	Comparing training benefits to costs

According to our survey results, the majority of utilities are performing Level 1 and Level 2 evaluations, with just over half of the organizations surveyed performing Level 3 evaluations. However, only four of the 13 organizations surveys conduct Level 4 evaluations, and only two perform Level 5 evaluations.

Conduct Level 4 and Level 5 evaluations of training

At a time when the need for training is made more acute due to increasing rates of retirement, ensuring the training that is being provided within organizations is as effective and efficient as possible is a top priority. Conducting Level 4 and 5 evaluations under the Kirkpatrick Model can provide training directors and managers with a clear picture of the organizational benefits that have resulted from specific training initiatives and indicate if these initiatives are maintaining a positive return on investment. The results of these evaluations will be highly beneficial in forging a path for training in the wake of workforce challenges.

For examples of various methodologies for evaluating training in use by Canadian utilities, please see the ESC training profile: *Training Evaluation* (www.brightfutures.ca/TLD/english/profiles/knowledge.asp).

5 Recommendations for Next Steps by the Electricity Sector Council

Internal training capacity can be enhanced at the organizational level by individual utilities within the industry. However, there are initiatives and strategies that can be implemented at a sector and industry level that will help to ensure the electricity sector as a whole will be prepared and equipped to meet the required workforce training and development needs created by impending retirements.

One outcome of the Training and Learning Development Project was the development of 10 recommendations for initiatives that the Electricity Sector Council could undertake to increase training capacity in the electricity sector. While all the recommendations provide practical strategies for enhancing training capacity, it is understood that the Electricity Sector Council and, indeed, the utilities themselves, do not have the resources to attempt the implementation of all 10 recommendations simultaneously. As a result, it is necessary to prioritize which recommendations should be considered the highest priority for near-term implementation.

In order to involve a broad cross section of industry in the prioritization process, attendees at the Electricity Sector Council's 2011 Bright Futures in Canada Conference were engaged. As part of the Training and Learning Development Project presentation at the conference, a facilitated exercise was held to prioritize the strategic recommendations. Participants were broken into groups and asked to determine which recommendations should be the highest priority for near-term implementation by the Council.

A points system was attached to create a score for the highest-rated initiatives. The results for the individual groups were then tabulated to create a consensus score for the room as a whole. As a result, the exercise captured the consensus opinion of a broad spectrum of electricity sector professionals and, as such, provides a road map for the next steps for action by the Electricity Sector Council.

As an outcome of this exercise, the three highest-scoring recommendations are presented here as those that should be viewed as the highest priority for implementation.

5.1 Highest-Priority Recommendations for Implementation

1. Develop occupational standards for industry trainers

Occupational standards are an inventory of the skills, competencies and knowledge that are required to adequately perform a specific job. Developed by experienced job incumbents from across the country, occupational standards have many human resource benefits including supporting worker mobility, informing training initiatives and recognizing skills.

The results from the training metrics survey revealed that qualifications for trainers vary across organizations. Developing an occupational standard for industry trainers at the national level would provide organizations with a benchmark of the skills, knowledge and abilities required of their trainers, thus making it easier to identify instructors' training needs.

2. Develop a self-assessment tool to assess requirements for training staff

Survey respondents flagged "staffing" as one of the most significant barriers and challenges impeding training activities in the electricity industry. In response to this concern, it is recommended that research be undertaken to quantify optimal or recommended training FTE-to-employee ratios in utilities of similar size and type. This research would be the foundation for the development of a self-assessment tool to assess organizational requirements for training staff. The ability to perform such an assessment would assist utilities in monitoring and controlling training costs. Further, having the ability to compare current training staff capacity to recommended industry benchmarks would provide companies with clear indications when investment in additional training resources is required.

3. Promote collaboration among utilities

For the industry to be prepared and equipped to meet the required workforce training and development needs created by impending retirements, collaboration among the utilities is required.

Through an analysis of information collected from individual utilities, it has become apparent that a number of organizations are duplicating efforts in terms of developing learning tools and training curricula. Rather than working individually, a more collaborative approach to the sharing or purchasing of training programs, curricula and program content would enable utilities to work together to build upon the work of others toward a common goal of maintaining a skilled workforce.

To facilitate this, the Electricity Sector Council could help establish a quarterly conference call for all internal training organizations to allow utilities to share information about their training activities.

In addition, the implementation of an online forum would create a working tool to allow institutions to find curricula or promote their own offerings. The Council could take on the role of managing the forum on an ongoing basis. Such a platform could facilitate open discussion regarding what resources are available within the industry currently. It could also raise awareness of opportunities for partnership and collaboration that could be of benefit to all utilities—regardless of size or business line.

5.2 Further Recommendations for Implementation

1. Develop a train-the-trainer program

The implementation of an industry-specific train-the-trainer program is an important progression that should arise from the development of occupational standards for trainers. Developing partnerships with community colleges that could offer programs that lead to the certification of industry trainers is one possibility.

Alternatively, standards for conveying certification could be established in conjunction with the Electricity Sector Council, allowing the Council to confer accreditation upon organization-specific programs that meet pre-determined criteria. The critical component of any train-the-trainer program would be designing, developing, implementing and evaluating competency-based training. Any program adopted should ensure trainers are capable of effectively using a variety of up-to-date learning technologies, including the ability to train in virtual environments from a distance.

2. Create a repository of external training resources and personnel

There are a variety of situations where an organization may wish to engage external training resources or personnel. Even organizations that diligently monitor their training staff capacity may still face situations where their existing resources are taxed by an unexpected spike in training requirements.

Other organizations may incorporate external training vendors as an integrated part of their overall training staffing strategy. Whatever the rationale for employing an external training resource, there is significant benefit to companies in having an updated repository of external training resources at their disposal.

To that end, the Council could initiate the creation and maintenance of a database of external vendors that would eliminate the need for utilities to source those relationships independently. As the repository evolves, functionality could be added that allows utilities to provide feedback to each other on their experiences with specific vendors.

3. Recommend best practices for measuring training return on investment (ROI)

The survey that comprised part of the Training and Learning Development Project revealed that very few utilities are currently measuring training ROI. For many organizations, the difficulty and complexity of calculating training ROI is the major obstacle preventing the adoption of methodologies to evaluate training ROI. However, the benefits of measuring training ROI are significant. Demonstrating ROI builds a compelling financial case for funding any future training programs. Measuring ROI can enable sound decision-making regarding which training initiatives to further develop and which to discontinue.

To assist organizations to incorporate this important process into their business practices, it is suggested that the Council provide the electricity industry with research and recommendations on best practices for measuring training ROI. Organizations that perceive measuring training ROI as overly complex may be unlikely to invest in launching measurement activities on their own. However, having the methodologies for effective ROI measurement presented and evaluated by an organization such as the ESC could allow for widespread adoption of such methodologies among utilities.

4. Sponsor modular learning opportunities

The widespread adoption of occupational standards will allow organizations to develop priority training needs. Priority needs are instances where the current training or practice in the organization is not lining up with the requirement identified in the occupational standard. These needs could be addressed through industry-sponsored modular learning opportunities. Training modules for events such as conferences and workshops that address specific priority needs provide targeted opportunities to close gaps between the occupational standard and the current knowledge or practice in the field. These events can also take the form of modular virtual presentations, which would allow participants to attend from a distance.

5. Create and host a review of existing learning management systems

The effective use of a learning management system can provide tremendous benefit to an organization. However, there are a significant number of product options on the market that can make it difficult for organizations to choose the system that best suits their needs. As a result, it is recommended that the Council create and host a review of existing learning management system options.

It would be of great benefit to utilities to have access to an independent "consumer guide" that evaluates the cost, complexity, ease of use, customizability and other features of the learning management systems on the market. Hosting this review, either as part of the ESC website or as a component of the proposed online forum, would ensure the accessibility of the content. Easy access to this type of information will allow utilities to make informed decisions when selecting the learning management system that will best augment their training processes.

6. Create an ESC video archive/library or YouTube channel

The development of a repository or video library for video materials would enable the sharing of training and informational videos among utilities and would be beneficial to the industry. There is opportunity for this archive to be used to provide information on aged equipment, present videos for refresher training, and allow utilities to document and share processes that are effective within their organization. Hosting the videos on a platform such as YouTube would make the content accessible to all parties interested in training and knowledge management within the electricity sector.

7. Develop and utilize an online industry training forum

As an initiative of the Training and Learning Development Project, an online industry forum has been recommended for future development. The goal of the forum would be to provide training organizations—including educational institutions, union training centres and in-house industry training functions—with an avenue for networking and building relationships so as to maintain and enhance industry training.

The forum could be used to identify experts in curriculum development, develop an online database of training curricula and share information on equipment. This space could also be used for sharing experiences and evaluating emerging training technologies.

If utilized to its full capacity, this forum can provide an outlet for open communication, sharing and collaboration among key players in the training arena within the electricity sector. In addition, it can provide a platform for delivering training modules that could be of benefit to the industry as a whole.

Acknowledgements

A project such as this requires the help and participation of numerous individuals and organizations. For that reason, we would like to express our sincere gratitude and appreciation to the following individuals. By generously giving their time and sharing their expertise and knowledge, they contributed significantly to the successful completion of the Training and Learning Development Project. Thank you.

TRAINING AND LEARNING DEVELOPMENT PROJECT STEERING COMMITTEE

John Sowagi-Chair
Manager, Leadership Training
Ontario Power Generation

Simon Assouline
Chef, Efficience et qualité des travaux
Hydro-Québec

Paul Blanchard
Member, Canadian Engineering Qualification Board
Engineers Canada

Nathalie Couture
Analyst
Human Resources and Skills Development Canada

Jodi Engel
Manager, Organizational Development
Toronto Hydro-Electric Systems Limited

Wendy Farrington
Analyst
Human Resources and Skills Development Canada

Norm Fraser
Chief Operating Officer
Hydro Ottawa

Wesley Johnston
Director, Policy and Research
Canadian Solar Industries Association (CanSIA)

Michelle Laurie
President
Local 258 IBEW

Bob Menard
Executive Managing Director
Power Workers' Union Training

Lori Pierson
Supervisor, Human Resources and Training
FortisBC, Inc.

Henry Reiser
Dean, School of Technology, Energy and Apprenticeship
Lambton College

The Electricity Sector Council:

Michelle Branigan
Executive Director
Electricity Sector Council

Leigh-Anne Donovan
Project Coordinator
Electricity Sector Council

Research consultants:

Bernadette Allen
CEO
The Competency Group

Tim Curley
Client Services Manager
The Competency Group

In addition, we would like to acknowledge the generous time and support of the employers, associations, educational institutions, unions and other key stakeholders who participated in this study.

Completion of this study was made possible through funding from the Government of Canada's Sector Council Program.

Electricity Sector Council
600–130 Slater Street
Ottawa, Ontario K1P 6E2
613-235-5540
info@brightfutures.ca

brightfutures.ca