KEEPING THE **FUTURE** BRIGHT

2004 Canadian Electricity Human Resource Sector Study

Canadian Electricity Association
Association canadienne de l'électricité

Canada

This project was funded in part by the Government of Canada.

The opinions and interpretations in this publication are those of the author and
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The Canadian Electricity Association

The Canadian Electricity Association (CEA), founded in 1891, is the national forum and voice of the evolving electricity business in Canada. CEA membership includes: corporate utility companies, major electrical manufacturers and corporate consulting companies, as well as several hundred other companies and individual members.

For more on CEA, visit the Web site at www.canelect.ca

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PART ONE — HUMAN RESOURCES CHALLENGES AND OPPORTUNITIES

Any lapse in the reliable supply of electricity has devastating consequences for the entire Canadian economy. Considering the central role played by the electricity sector in the Canadian economy — supplying Canadians with electricity and fuelling other industries — risks posed due to projected retirement in the industry need to be addressed on an industry-wide basis.

Ensuring an adequate skilled workforce is imperative. The Canadian Electricity Association (CEA), in partnership with Human Resources and Skills Development Canada (HRSDC), commissioned a comprehensive human resources study in 2004 to provide a thorough overview of human resources challenges and opportunities for the Canadian electricity sector. The findings will assist in the development of a forward-looking human resource strategy.

Purpose and objectives of the study

The key objectives of this study were:

- to develop an industry profile that describes the business/regulatory environment, the impact of technological change and the human resource profile of the electricity sector;
- to determine the root causes of the identified human resource issues;
- to identify industry "best practices" with respect to human resource planning/practices;
- to develop a vision and recommendations to create a human resource strategy for the sector.

This is a summary of the comprehensive 2004 Canadian Electricity Sector Study. The detailed full report is available from the Canadian Electricity Association.

Research activities

The results are based on extensive research activities, including:

- site visits and surveys with 32 primary producer contacts representing 38 companies;
- a survey of 31 associate producers;
- a survey of 3,514 employees in the electricity sector;
- a survey of 74 educational and/or training institutions offering courses/programs related to the electricity sector;
- 38 interviews with key stakeholder groups, including employers, industry associations, training institution representatives and union representatives;
- data collection activities for five case studies to identify best practices in the electricity sector;
- 11 focus groups with managers, employees and youth;
- secondary research including a review of existing literature and statistical databases, as well as an extensive Internet search of relevant education and training programs.

The impact of retirement

Retirement in the electricity sector will have a substantial impact and could pose significant risks to the future of the industry. Employers indicate that over 17% of the 75,000 existing workforce will be eligible for retirement in the next five years, and 37% of the workforce will be eligible by 2014. Based on retirement estimates, the sector will need 9,000 people in technical positions in the next five years and more than 17,000 over 10 years.

Retirement could diminish the capability of the electricity sector in the following ways:

- infrastructure projects slowed or stopped due to lack of human resources;
- reliability lessened, not enough staff to maintain system support;
- increased cost of production;
- greater or earlier reliance on automated systems;
- one company failing to manage the issue can impact all the others (e.g., 2003 North-East blackout);
- new entrants to replace retirees in the workforce may have a negative impact on safety and productivity (new workers are less productive and less knowledgeable).

Given that employees in the trades currently require five or more years to become proficient at their job, retirement poses a significant safety and performance risk. Workers — representing nearly one-third of a million years' expertise — will be replaced by staff with marginal practical experience.

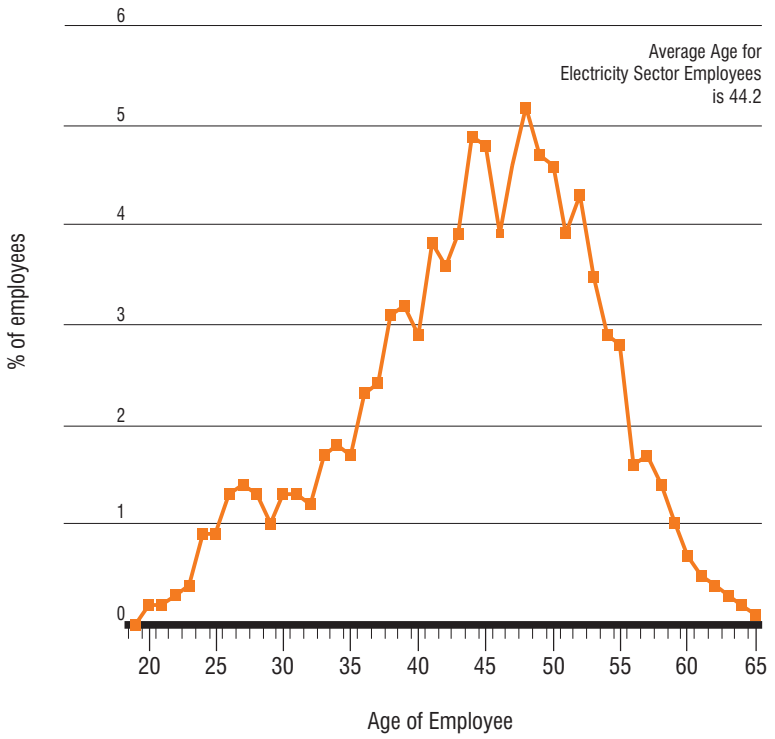
In addition, nearly one-third of primary producers surveyed either did not have or did not know whether they had a succession plan, suggesting that a substantial percentage of utilities could be unprepared for workers to retire. There are relatively few options that would encourage employees to work past their eligible retirement date.

The technology challenge

The evolution of technology in the electricity sector is constant. Staff reported being frequently exposed to new equipment. Training requirements for entrants have grown significantly over the past 20 years.

The continuing use of new and changing technologies such as Supervisory Control and Data Acquisition (SCADA) systems and power line networking, as well as the introduction of more "green" technologies, and increased distributed generation, will require the "re-skilling" of the existing and future labour force to incorporate these new technologies.

Age of Employees in Electricity Sector



Source: 2004 Canadian Electricity Sector Study Employee Survey (n=3,330).

Collaboration is a priority

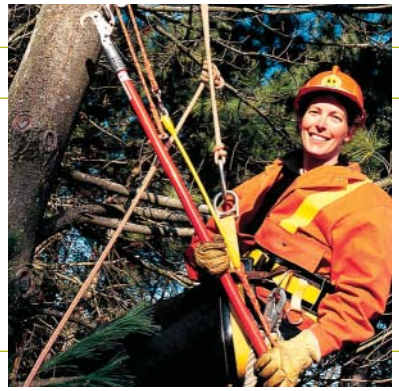
New hires will require significant in-house training, supervision and mentoring. Currently the industry trains for a relatively low number of new positions, with a 4% annual turnover average. In future, a large-scale influx of new workers with little or no practical experience will place considerable strain on existing staff to train and mentor.

Educators reported difficulty providing modern equipment for training. However, collaboration between utilities and educational/training institutions could help minimize risks associated with new recruits, who represent up to 40% of the workforce.

To respond positively to these serious challenges, survey participants agreed the industry should:

- co-operate to promote the electricity sector to youth;
- ensure universal recognition of certification/credential for key occupations to facilitate recruitment of international workers;
- develop industry-funded regional training centres.

Regional training centres were thought to allow for economies of scale in training new staff. Sharing costs across multiple employers, particularly for smaller utilities, was preferred.



PART TWO — SHEDDING LIGHT ON CANADA'S ELECTRICITY INDUSTRY

Canada's economy relies on electricity. Disruptions in supply have immediate and large-scale impacts. Industry, education and training institutions, regulatory authorities and policy makers must have an in-depth understanding of impending human resource challenges that can affect the generation, transmission and distribution of electricity.

Trained and experienced workers are essential to ensure the long-term stability of Canada's electricity supply. However, technological innovation, demand and environmental considerations suggest that skill sets required for the next generation of workers may be substantially different from today.

Inside the Canadian electricity market

The Canadian electricity sector is made up of:

- provincial Crown Corporations;
- municipal utilities;
- investor-owned utilities;
- industrial own-use establishments;
- non-utility generators, such as independent power producers that sell electricity.

More than half (58.2%) of firms are engaged in distribution and over one-third (36.2%) are in generation. Only 0.2% are nuclear generation.

The Canadian electricity sector is a *"capital intensive"* sector. Total investment per worker in the utilities sector (of which the electricity sector represents two-thirds) was more than six times the national average. The proportion of firms with 500 or more employees in the electricity sector is almost 20 times that of the industrial average. Distribution firms tend to have more employees than transmission companies, suggesting that different size companies will likely have different human resource needs/requirements.

Business and regulatory environment

Canada's electricity industry involves three major functions:

- **Generation** — the "process of producing electric energy by transforming other forms of energy" or the amount of energy that is produced.
- **Transmission** — moving higher voltage electricity in bulk from the source to distribution centres.
- **Distribution** — electricity moved at lower voltages from major substations to customers.

Canada's aging electricity infrastructure will require significant capital investment in the future. In addition, demand-driven growth — reduced electricity imports due to increased U.S. demand — and moves toward "cleaner" technologies could spark additional investment for electricity establishments.

A vertically integrated monopoly market structure has been the tradition in Canada. Establishments within the sector owned and operated generation, transmission, and distribution facilities. More recently, a shift toward electricity market restructuring has transformed many electric utilities into separate generation, transmission and distribution companies.

Incentives for market restructuring, or "unbundling," are:

- improved economic efficiencies;
- exploring innovative ideas to increase competitiveness;
- increased consumer choices;
- greater adaptability of national economies;
- reduced prices and increased competitiveness in the global marketplace.

Consequently, competitive market models are emerging across North America and in other Organisation for Economic Co-operation and Development (OECD) countries. These market models include:

Wholesale competition: *"Generators or marketing agents compete to sell power to the distribution utility, which then retains the monopoly of retail sales via regulated tariffs that bundle commodity and delivery charges."* Wholesale competition has been introduced in all Canadian provinces with the exception of Newfoundland and Labrador, PEI and the Territories.

Retail competition: *"Generators or retailers may sell directly to customers, with the distribution utility delivering the commodity under separate, unbundled delivery tariffs regulated by a utilities commission."* In Canada, full retail competition has been introduced in the provinces of Alberta and Ontario.

Market restructuring also involves privatizing publicly owned utilities and the establishment of separate stand-alone companies for power sales/exports. There has also been significant outsourcing of non-core functions, such as billing and customer service, to private enterprise and others.

Electricity supply

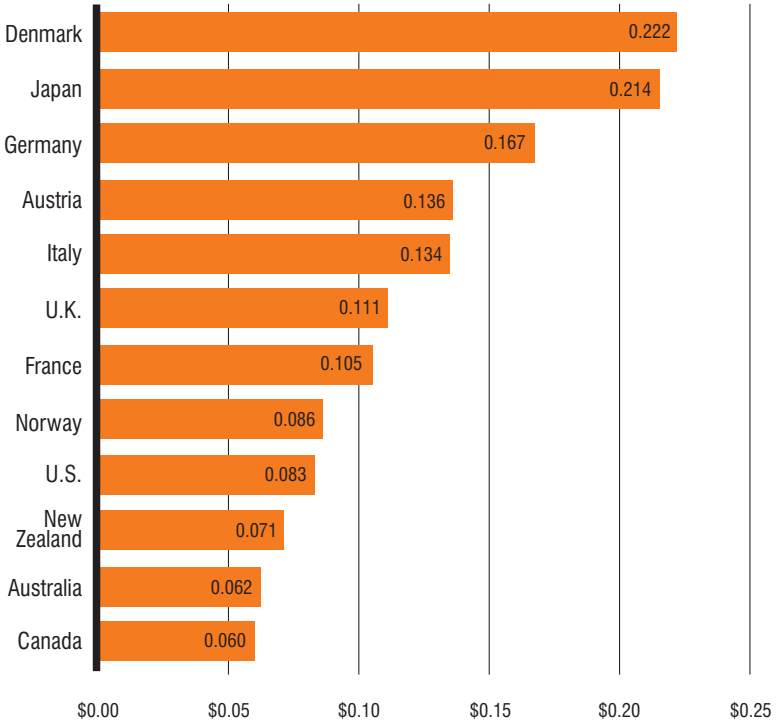
Canada is the fifth largest producer of electricity in the world, accounting for about 3.8% of the world's total electricity production. Canada produces more electric power than Germany, France, and the United Kingdom. On a per capita basis, Canada is the *third* largest electricity producer in the world. Canada's total electricity production has increased by nearly 10% over the past decade.

CLEAN ENERGY — To meet Canada's commitments to reduce GHG emissions, it is anticipated the electricity sector will increase use of renewable energy sources — hydro, wind, solar, tidal, and biomass — along with cleaner sources of energy (e.g., nuclear). Hydropower and other sustainable energy sources averaged 61% of Canada's total electricity production — significantly higher than the U.S. average of 9%.

Canada has one of the most diversified electricity generation bases in the world. The majority (60%) of electricity is generated from hydro, with another 24.2% from thermal (coal) and 12.4% from nuclear power. Hydropower has increased 2.9% over the past decade, and is expected to continue to increase in the next decade.

At 132% growth over the past decade, the use of natural gas in electric power generation has had the most significant increase. Low capital cost, high energy efficiency, and relatively shorter construction periods have been identified as reasons for growth. The use of nuclear energy for electricity declined by 18% from 1993 to 2002.

Residential Electricity Prices in Selected OECD Countries (2002) — in US$/unit



Source: International Energy Agency. "Key World Energy Statistics." Paris, France, 2003. http://www.iea.org/statist/key2003.pdf

Electricity consumption

In addition to being a global leader in electricity production, Canada is also a top consumer of electric power. In 2003, Canada used about 3.6% of total world consumption, and about 12% of total North American consumption. Canadian electricity demand has grown steadily from 1993 to 2003, with an increase of more than 16% over the period, and an average growth in demand of 1.8% per year. Meanwhile, Canada's population growth has remained steady at around 1% per year.

At 16%, Canada's growth in demand in the last 10 years has been greater than its 10% growth in supply. Demand for electricity has grown faster than total population, indicating that consumption per capita has increased despite efforts to reduce through demand side management and other conservation activities.

Supply and demand projections

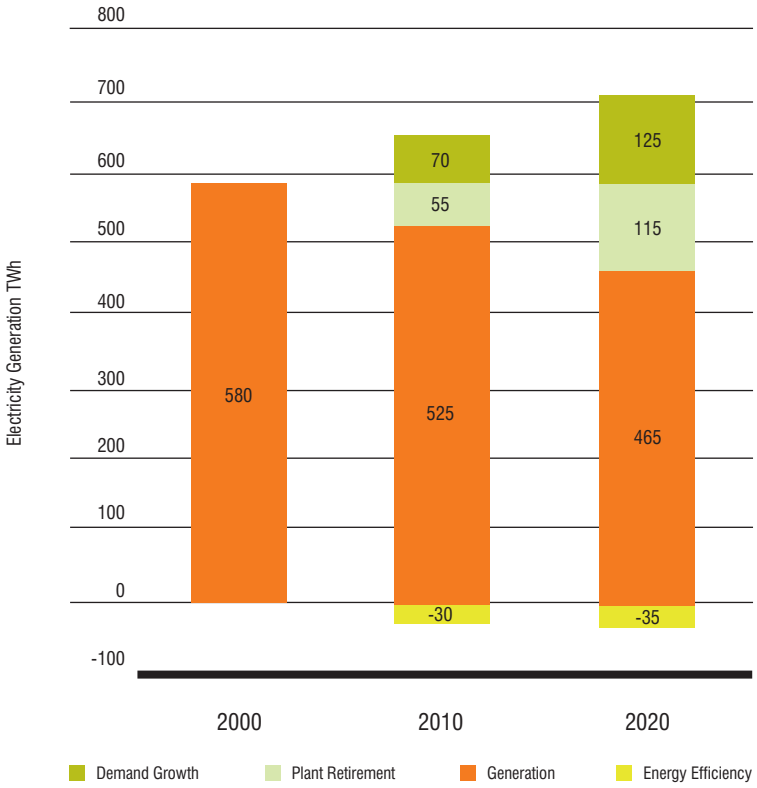
Industry experts predict more capacity will be required to the year 2020 to address demand, replace plants and supply exports. Electricity demand is expected to keep pace with demographic and economic growth, an average increase of 1.3% per year. By 2020, new plants are projected to generate approximately 205 TWh, which represents over one-quarter (29.1%) of estimated future demand.

Electricity exports and imports (Canada-U.S.)

Canada is a major exporter of electricity. In 2002, Canada was the fourth largest exporter of electricity in the world, ranking behind France, Paraguay and Germany, respectively. Industry experts estimate that about 7–9% of Canada's total electricity production is exported to the U.S., yielding annual revenues of between $1 billion and $2 billion. U.S. exports have been declining since 1996–1997. Increased domestic demands, and no subsequent increase in generation capacity, were cited as reasons.

Over the same period, Canada's electricity imports have risen. The National Energy Board has identified the removal of several nuclear-generating units from Ontario, as well as improved access to electricity markets in the U.S., as reasons for this significant increase in imports.

*Canadian Electricity Demand Projections to 2020**



Source: Canadian Electricity Association. "A Bird's-Eye View of Electricity Supply and Demand to 2020." 2001.
*Average of NRCan, NEB, and MARKAL projections.

Technological impacts

Significant advances in technology are being implemented by utilities across Canada:

- **Distributed Generation (DG)** — more complex, automated systems involving the use of small-scale power generation technologies located close to the load being served.
- **Distribution Automation (DA)** — operating a self-diagnosing and self-healing distribution grid.
- **Demand Side Management (DSM)** — currently customer-based initiatives, but in the future, DA will have the ability to assist with DSM efforts.
- **Automated Meter Reading (AMR)** — which can work in conjunction with DA to automatically report outages, provide additional services such as security systems, broadband, power quality, etc.
- **Power Quality (PQ)** — 24-hour monitoring with different levels of service (user pay).

Generation — Some analysts predict that service companies, fossil fuel suppliers and electric generators will converge to create "energy providers," effectively replacing Canadian gas and electric utilities. Customers will have a wider array of products and energy providers from which to choose:

- "clean" technology, such as wind, solar, geothermal and tidal generating technologies;
- fuel cells;
- hybrid systems;
- distributed generation/small-scale generation;
- fluidized bed combustion;
- supercritical steam generators;
- co-generation;

- integrated gasification combined cycles (IGCC);
- high-efficiency combustion turbine units.

Transmission — High technology products, such as Supervisory Control and Data Acquisition (SCADA) systems, are becoming increasingly more sophisticated. Advances in satellite communications, wireless communication and Internet are increasing the sector's ability to monitor transmission and distribution infrastructure/systems. Experts suggest that by 2020 the transmission system will be an automated "intelligent system," reducing the human role to a "management-by-exception basis."

Distribution — Automation is being implemented by some Canadian utilities. The self-diagnosing and self-healing distribution grid is expected to reduce workforce requirements for operations for transmission and distribution. Micro generation, expected to become common on the distribution system, will require management of multi-directional power flows with customers.

Power line networking — This new technology provides high-speed Internet access over power lines, and has the potential to make the Internet more widely accessible, particularly in rural and remote areas. This could represent a possible new line of business for electricity companies.

Alternative electricity sources — In 2002, emerging renewable and alternative electricity sources — solar, tidal, biomass, bio-gas and solid waste represented 2% of the total Canadian capacity. These sources are likely to grow substantially due to rising public interest in developing environmentally-friendly energy sources.

PART THREE — HUMAN RESOURCE PROFILE

A key element of the Electricity Sector Study was to develop a profile of the technical workforce in electricity generation, transmission and/or distribution. Administrative support positions were excluded.

Employment in the Canadian electricity sector

There are many sources of statistics all measuring different information on the number of people employed in the electricity sector. Statistics Canada publishes four different estimates and the Canadian Electricity Association also maintains information. Employment numbers are subject to considerable variation — from 98,725 (LFS — 2003) to 65,600 for CEA members. The majority of CEA-listed firms had 300 or more employees (21 of the 32 surveyed). Firms participating in the survey had 44,443 employees, including technical and support staff.

The electricity sector's labour force decreased during the 1990s, with its number of workers falling from 98,060 in 1993 to 83,210 in 1998. Restructuring in the mid-1990s was identified as the key reason. Employment in the sector is still well below the levels of employment of 10 years ago.

Workforce profile

Women are under-represented in the electricity sector, accounting for only 25.4% of all employees. This is significantly lower than the national average, where women represent 46.9% of the workforce. At the time of the study, 6.1% of trade staff, engineers and managers/supervisors were female.

Statistics Canada Census indicates 2.2% of the electricity sector workforce is Aboriginal. This is slightly lower than the national average, where 2.6% are Aboriginal.

Estimates of Current Employment in Electricity Activities Survey Data

Group	*Number of Organizations*	*Total Estimated Employment*
Primary Producers[1]	34*	
Technical/Production Staff		47,706
Support Staff		16,565
Total		**64,271**
Associate Producers[2]	78	
Technical/Production Staff		9,951
Support Staff		1,555
Total		**11,506**
Total Electricity-Related Employees	112	
Technical/Production Staff		57,657
Support Staff		18,120
Total		**75,777**

* Representing 38 firms.

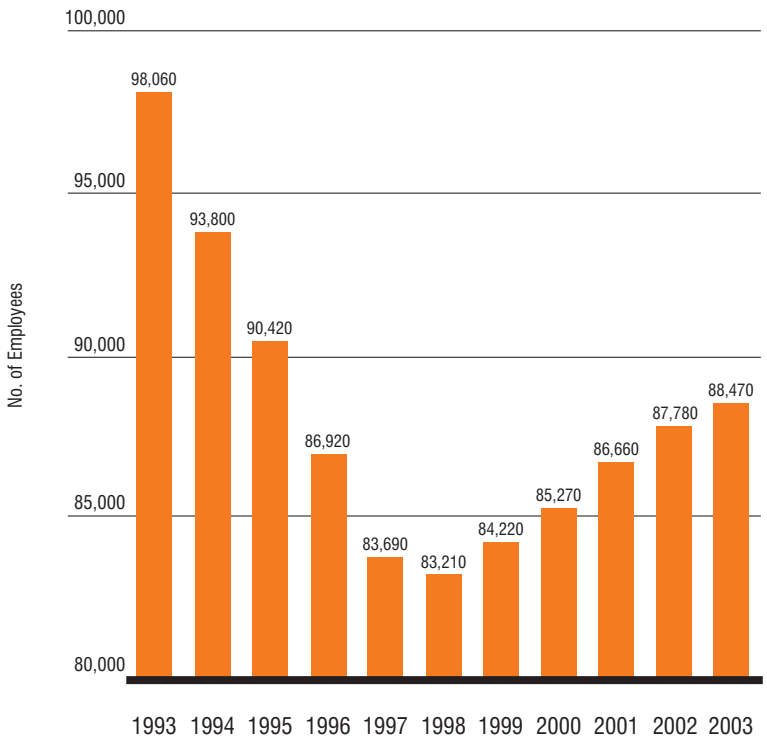
[1] Primary line of business is electricity generation, transmission or distribution.

[2] Excludes 6 associate producers who participated in the survey but do not have staff in generation, transmission or distribution.

While visible minorities make up 12.6% of the national workforce, they represent only 7% of workers in the electricity sector. A Conference Board of Canada study predicts almost 18.4% of the labour force, or one in five workers, will belong to a visible minority group by 2016.

Language preferences — Little information was available on the language profile of workers in the electricity sector. Statistics Canada data from the 2001 Census state 62.2% of workers in electricity generation, transmission and distribution specify English as their mother tongue; 27.1% indicate French as their mother tongue.

Employment in the Electricity Sector in Canada (1993–2003)



Source: Statistics Canada, SEPH.
Note: LFS data for employment displays a similar pattern, with the employment "trough" recorded in 2000, not 1998 as is the case for SEPH.

Education — Survey and focus group research indicate that even for trade positions, employers are more likely to require a college diploma for technical positions.

A majority of engineers reported completing some form of university education (57.0%). Managers indicated a mix of technical/apprenticeship training (30.0%) and university education (34.9%).

Key Characteristics of Electricity Sector Workforce

Characteristic	*Yes*	*No*	*Don't Know/ No Response*
Aboriginal	2.3%	93.3%	4.4%
Possess Disability	2.2%	94.2%	3.6%
Member of Visible Minority Group	6.0%	89.5%	4.5%

Source: 2004 Canadian Electricity Sector Study Employee Survey (n=3,514).

Compensation, benefits, working conditions

Compensation — Employees in the electricity sector earned 11% more than staff in utilities, 19% more than staff in gas distribution systems and nearly double (84%) that of staff in all industries. The relatively high salaries likely reflect the long-term tenure of many employees in electricity occupations.

From 1997 to 2001, average weekly earnings in the electricity sector rose from CAN $893.70 per week to CAN $1,001.20 per week, a 12% increase over the five-year period. Utilities managers were highest paid among occupations considered ($97,956 average annual base salary) followed by other supervisors ($82,560), mechanical engineers ($79,362) and electrical engineers ($78,038). These relatively high average salaries likely reflect the long-term tenure of many employees — an average employee had worked for his/her utility for 16 years at the time of the survey.

The majority of non-support staff was full-time according to primary producers.

Benefits — The greater average tenure of staff will impact the value of benefits provided in that the "average" benefits reported would be closer to top benefit levels within the occupation.

Highest Level of Formal Education Completed by Major Occupation Group

Response	*Trades*	*Engineers*	*Corporate and Support*	*Managers/ Supervisors*	*Other*
Did not complete high school	1.9%	0.4%	0.7%	0.2%	2.4%
High school	21.3%	2.3%	24.0%	14.6%	17.5%
Technical/Apprenticeship/Vocational certificate	50.4%	13.3%	13.2%	30.0%	20.6%
College diploma	20.5%	25.2%	26.1%	16.7%	17.5%
University degree (undergraduate)	3.2%	45.3%	24.9%	24.8%	28.6%
Graduate degree	0.2%	11.7%	8.5%	10.1%	11.9%
Don't know/No response	2.5%	1.8%	2.7%	3.5%	1.6%

Source: 2004 Canadian Electricity Sector Study Employee Survey (n=3,431).

Working conditions — Overall, research suggests electricity sector workers are generally satisfied with their employment:

- Less than 10% of more than 3,500 survey respondents expressed any dissatisfaction with work environment, co-workers and/or opportunities for training or professional development.
- Both males (86.2%) and females (93.9%) indicated a high level of satisfaction with benefits available.
- Almost one-fifth (19.1%) of employee respondents said they were somewhat/very dissatisfied with future career prospects. This could partially reflect the nature of change in the sector, with some staff unsure as to their future due to influences such as new technology, deregulation and outsourcing.

Shift work — Electricity workers were critical about some elements of their job. The frequency of "on-call" work was identified by a significant proportion of workers (23.8%) as having a large negative effect. Other job characteristics that elicited significant negative responses included the need to work in a rural/remote location (19.3%) and the frequency of shift work (13.9%). Only 8.5% of employees surveyed reported that they completed shift work.

Unionization — The primary and associate producers in the electricity generation, transmission, and distribution sector reported that 81.8% of non support staff were covered by a union — a proportion significantly greater than the national average of 30%.

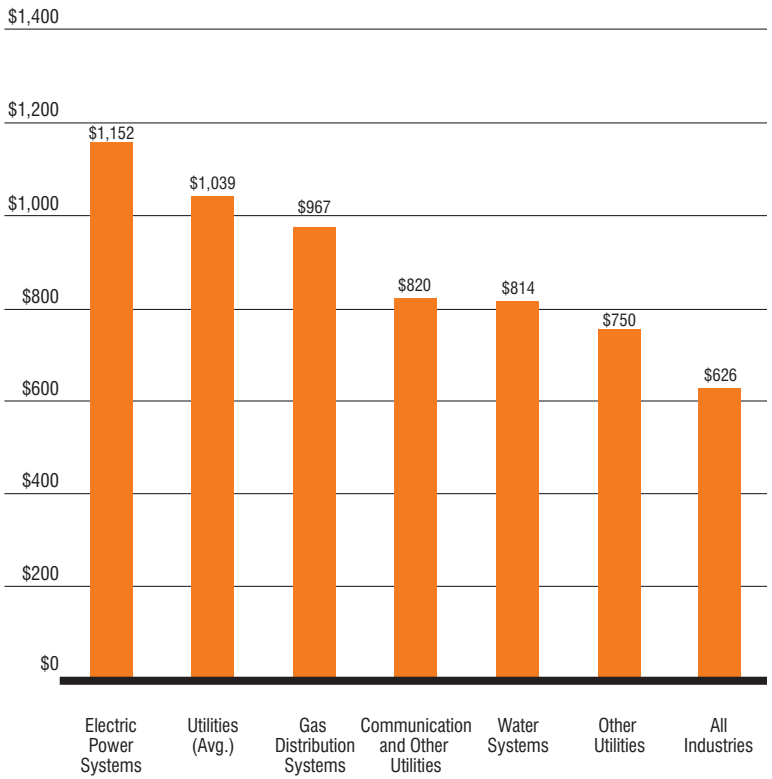
Short term employment goals — Of surveyed employees, 34.4% believed they would be at the same job in their current organization for the next five years. An additional 31.9% believe they will be working at a higher-level job with their current firm. Another 13.8% said they hope to retire in the next five years. Only 4.1% of employees indicated they would most likely be working outside the electricity sector.

Age of workers

Compared to the overall Canadian economy, the electricity industry has markedly fewer employees under age 30 but considerable greater staff aged 40 to 54.

- Workers 40 to 54 years of age make up nearly two-thirds (65%) of the total workforce, compared to 38% of the Canadian workforce.

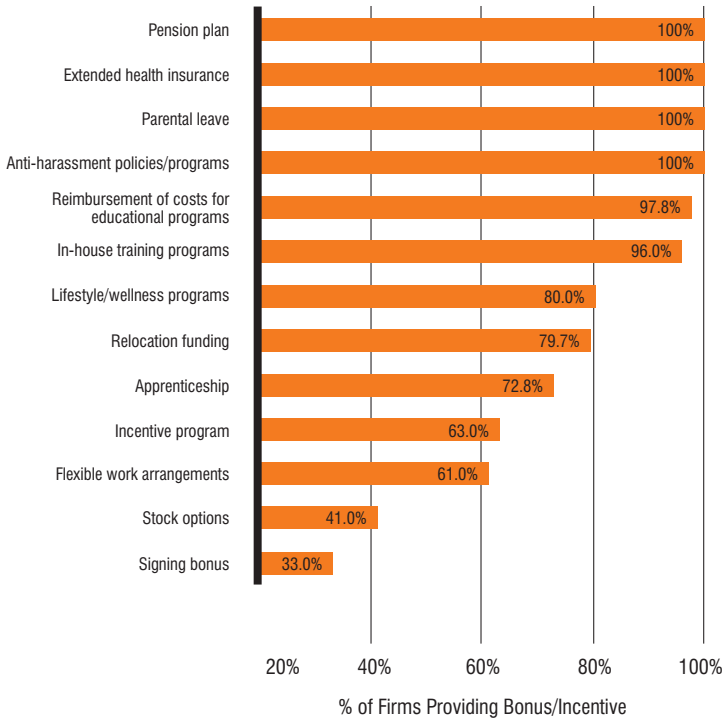
Average Weekly Earnings in Electricity and Other Sectors



Source: Statistics Canada, based on 2000 income.

- Likely reflecting the availability of defined pensions, less than 3% of the electricity sector workforce is 60 years of age or older while almost 6% of Canada's workforce is 60 years of age or older.
- Less than 5% of electricity sector employees were in the 15 to 24 year age group. In comparison, 15% of the Canadian workforce was less than 25 years old.
- Workers were somewhat younger in Manitoba and Saskatchewan (average age 43.5) and slightly older in Atlantic Canada (45.2). Overall, Alberta indicated the lowest percentage of employees aged 50+.
- Nuclear power generation staff was most likely to be over 50 years old, with 38.3% of non-support staff 50 years or older. Non-support staff in transmission and distribution tended to be younger on average, with 29.2% and 29.3% of staff (respectively) falling into the 50 plus age category.
- On average, for all trades-related occupations, over one-quarter (28.6%) of employees were 50 years of age or older. In contrast, the proportion of young employees (less than 30 years of age) was markedly lower — only 7.1% of trades-related employees indicated that they were less than 30 years old.

Programs or Benefits Designed to Recruit or Retain Non-Support Staff



Source: 2004 Canadian Electricity Sector Study Primary Producer Survey (n=12 to 30).

Satisfaction with Current Job

	Large Negative Effect	*Small Negative Effect*	*No Effect*	*Small Positive Effect*	*Large Positive Effect*	*Don't Know/Not Applicable*
Support for further education	2.5%	5.5%	17.3%	37.0%	30.9%	6.7%
Family-friendly work environment	3.6%	6.0%	18.2%	32.2%	34.7%	5.3%
Wellness programs	1.1%	2.1%	22.1%	39.7%	26.4%	8.7%
Flexible work arrangements	2.1%	4.8%	17.8%	27.8%	31.7%	15.8%
Incentive programs (e.g., employee reward programs)	6.3%	5.4%	19.3%	30.1%	27.1%	11.8%
Remote work location	7.8%	11.5%	28.8%	8.8%	5.8%	37.3%
Frequency of "on call" work	6.6%	17.2%	27.3%	9.3%	3.9%	35.7%
Frequency of shift work	6.2%	7.7%	29.9%	3.8%	4.4%	47.9%

Source: 2004 Canadian Electricity Sector Study Employee Survey (n=3,514).

- Employees in engineering were slightly younger, with the proportion of engineers less than 30 years at 15.3%, more than double that of trades-related occupations (7.1%).

Accidents and illness

CEA accident statistics show injury and illness rates have fallen since 1997. Across all utilities, injuries dropped by 8.8% in 2002, with a decrease of 49.2% since 1992. Large utilities led the trend with a decrease of 14.7% in 2002 and 60.1% since 1992.

Larger utilities (2,300 or more employees) reported a lower number of days lost due to accident (0.37 days/employee) compared to medium-sized (300 to 2,299 employees) utilities (5.2 days/employee) or small (less than 300 employees) utilities (2.0 days/employee). Most utilities did offer a return-to-work or flexible work arrangement to injured or ill employees (93.8%).

Regional/business line characteristics

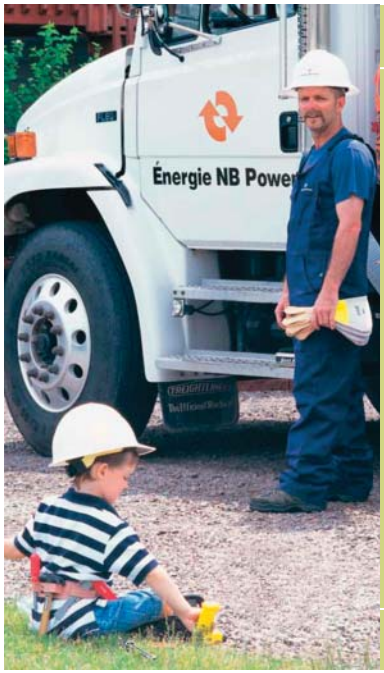
It is clear that the workforce in different regions and the various business lines is unique in age and other social and economic characteristics.

Human resource implications

Changes in the economic, business and regulatory environment will have significant ramifications for Canada's electricity sector workforce:

- Over the next 20 years, Canadian utilities will need to increase existing supply by an estimated 22% and replace 20% of existing infrastructure. A workforce will be required with skills and training to manage this change.
- Increasing U.S. demand will pressure Canadian producers to ensure that an adequate supply is available for growing domestic industry and consumer consumption.

- The evolution of fuel generation will transform skills requirements. Industry has identified significant change in technology associated with Supervisory Control and Data Acquisition (SCADA) systems. The use of self-monitoring systems and telecontrol has resulted in replacing components rather than maintaining infrastructure.
- "Green" technologies in generation, transmission, and distribution have created a shift toward more knowledge-based occupations that require higher skill levels. However, Industry Canada's *"Canadian Electric Power Technology Roadmap: Forecast,"* predicts new technologies may also reduce staff as "intelligent" transmission and delivery systems take over data processing and decision making.
- Canadian electricity sector employers will likely experience significant turnover in management in the next five to 10 years. For example, 57.4% of utilities managers and 45.9% of supervisors of electricians or power line workers surveyed were 50 years of age or older. An additional 30.2% are between the ages of 45 and 49 and 16.8% are between the ages of 40 and 45. One in 10 (10.6%) managers is currently under age 40; only 2.1% of utilities managers is under 40 years old.



BEST PRACTICE

Wellness Program

Since 1999, the Employee Wellness Services human resource strategy at NB Power aims to build a respectful workplace, one in which the employee is highly valued. Through establishing an environment that is respectful to diversity, provides flexibility and acknowledges work/family balance, the ability to retain existing employees and attract new ones is increased. By adopting such an approach, NB Power's image as a respectful employer increases their chances to recruit the best new employees while ensuring the resilience of their aging workforce.

Demographics of the Canadian Electricity Workforce — by Line of Business

Characteristic	Generation	Transmission	Distribution	Integrated	Average[1]
Employees in Sample	167	552	731	2,007	3,514
Employee Profile:					
Average age (in years)	48	44	43	44	44
Years employed in sector	20	20	18	19	19
Years employed — current employer	18	18	14	16	16
Average hours worked weekly	40	42	40	41	41
% working full-time	90.4%	97.8%	96.4%	95.9%	96.0%
% in regular position	90.4%	98.4%	95.5%	96.6%	96.3%
% of employees <30 years	4.6%	7.2%	11.4%	7.0%	8.0%
% of employees 50+ years	46.4%	27.2%	25.0%	31.6%	29.9%
% female	30.5%	13.2%	21.1%	20.9%	20.4%
% Aboriginal	3.6%	1.8%	2.1%	2.4%	2.3%
% visible minority	7.2%	7.2%	9.6%	3.9%	6.0%
% disability	2.4%	2.7%	2.1%	2.1%	2.2%
Education:					
% with high school or less education	16.8%	25.6%	21.7%	16.9%	19.1%
% with technical/apprenticeship/vocational certificate	16.2%	19.7%	31.9%	35.8%	31.0%
% with college diploma	19.8%	23.2%	25.2%	20.9%	22.0%
% with university degree or higher	43.1%	28.4%	18.1%	24.4%	26.3%
Worker Satisfaction:					
% with overall working conditions	78.4%	80.8%	86.9%	84.2%	83.6%
% with job training	64.1%	73.0%	73.4%	73.1%	72.3%
% with future career prospects	46.7%	58.4%	63.4%	63.6%	61.9%

Source: Employee Survey (n=3,330 to 3,514).

[1] Average includes one firm classified as other.

PART FOUR — PREPARING FUTURE WORKERS — EDUCATION AND TRAINING

A key element of research was to assess the ability of education and training systems to meet future demand for workers. This section looks at enrolment trends in programs/courses typically associated with occupations in the electricity sector.

Courses and programs in Canada — A web-based search revealed 117 post-secondary institutions offering electricity-related courses and programs. Another 185 departments offered electricity-related courses. The most common type of training identified was for electrical engineering technologist (22% of programs), electrician (20.3%), electrical engineer (15.4%) and mechanical engineer (12.2%).

Graduates — The largest group of educational and training institutions was comprised of colleges (46%), followed by universities (28%). The majority of graduates in 2003–2004 were from colleges, which produced 2,335 graduates, or 47.4% of the total graduates in electricity-related fields. Technical institutes accounted for 24.4% (1,203 graduates/completers) and universities produced 1,165 graduates, representing 23.7% of all graduates in electricity-related fields.

Enrolment — Overall, educators reported a total of 4,921 graduates or completers in 2003–2004. Enrolment is projected to increase for university programs, but decline in college/university-college programs. The number of expected graduates/completers was significantly lower than the number of students enrolled (4,921 versus 13,789 in 2003–2004).

In total over the next 10 years, institutions anticipate 14,279 students will enrol in electricity-related training or educational programs per year. It may be expected that 5,100 students will graduate or complete training. However, there is widespread demand across all industries for graduates.

A national survey of the Canadian engineering profession in 1997 suggested only 5% of engineers work in the electrical utilities sector. In a 2003 survey of Alberta university and college graduates, less than 2% of recent electrical engineering or mechanical engineering graduates were hired to work in the electrical utility sector.

Challenges in providing programs

The cost of technology and equipment associated with providing electricity-related courses and programs was reported by 67.5% of respondents as the top challenge. Other commonly identified challenges included insufficient number of students enrolling in such classes (43.4%) and the changing state of the electricity sector/changes in technology (34.9%).

Manager focus groups concluded that challenges in providing education were in part due to the slow-down in the industry in the 1980s and 1990s (and the associated lack of hiring). Training programs

According to institutions providing such estimates, the number of students expected to enrol per year increased by 3.6%. However, 33.7% of training providers described enrolment related to the electricity sector as growing faster than other programs.

BEST PRACTICE

Partnership with Educational Institutions

Ensuring an adequate supply of trained power systems engineers to replace retiring staff was seen as critical to maintaining the reliability and performance of power systems.

Given that it was not seen as economically justifiable to support power engineering courses taught independently by the universities in the region, Hydro-Québec established a partnership with six local universities to create an independent and privately-funded Institute of Electrical Power Engineering. This Institute has enabled universities desiring to do so to pool resources in offering programs in power engineering, and has helped to rekindle interest among students and university administration in this area.

tailored to the electricity industry were shut down and became nearly non-existent. While apprenticeships have been built up over the past five to seven years, managers expressed concern that the capacity to train a sufficient number of workers is lacking.

Gaps in education

The most common gap reported by post-secondary institutions was a lack of placements available for co-ops/apprentices/internships within industry (22.7%). Insufficient preparation of high school students in math and science was also noted (15.9%). Engineers in focus groups agreed that training on important new digital protection and control systems was abstract, and did not include sufficient application training.

New workers will require different training than in the past. Given the increasing use of all capacity, workers and technicians may not have the opportunity to work on systems in "off-line" situations. Typically, it was noted that future training should recognize:

- **Need to work in "hot" situations** (lines or systems that cannot be shut down). With limited excess capacity, utilities do not have the ability to use alternate capacity while repairs are made to systems/distribution networks. The incidence of "working hot" was projected to increase over time.
- **Exposure to multiple generation process/systems**. Future power generation requirements will likely include a mixture of both traditional and non-traditional (e.g., wind, solar, biomass, etc.) power

generation. Education and training programs should provide basic instruction/overview of each of these generation technologies.

Due to recent initiatives in Ontario, it is expected there will be a marked increase in the demand for nuclear technicians and managers.

Certification requirements

Credentials and certification were seen as important, to ensure safety for companies relying on individual professional judgment — for engineers, operations individuals such as power line technicians, thermal and nuclear plant operators. Companies prefer hiring fully functional workers who do not require substantial in-house training.

Role of employers in providing training

Employee focus groups felt that employers provided substantial training opportunities. There was more support for technical training, compared to leadership or management training. Some employee groups suggested a greater emphasis on technical or engineering training provided by specialized trainers.

Management training should be targeted to relative technical training, which was seen as paramount. In-house, or regular training classes provided on site rather than "on-the-job", were reported by 78.1% of primary producers. A majority of employers also reported frequently sending employees for training at colleges (62.5%), private certification programs (50.0%), and universities (46.9%).

BEST PRACTICE

Internal Training Program

As with most companies in the electricity sector, Aquila Networks Canada experienced a regular need for training. One of the challenges facing the company was that prior to 1998, Aquila had no formal management system in place. The company decided to refocus its training budget and set up a separate training department, called the Educational Development Centre (EDC), to deal with training issues.

The Centre's programs for equipment training proved to be so effective they were sold internationally and across Canada. In the fall of 2003, the director of the Centre created an external business out of the training program.

Employee Estimate of the On-the-Job Experience Required to Become Proficient

Major Group	*% of Employees Citing Time*					*Average (Years)*
	<1 Year	1–2 Years	3–4 Years	4–5 Years	>5 Years	
Management (n=424)	5.0%	15.3%	24.1%	21.5%	22.9%	5.0
Trades (n=1,437)	7.2%	10.9%	23.8%	26.2%	20.1%	5.0
Engineers (n=563)	6.4%	23.1%	19.4%	22.9%	11.0%	4.1
Other (n=126)	9.5%	27.0%	15.1%	12.7%	20.6%	3.7
Corporate Support (n=881)	12.5%	44.8%	11.2%	9.6%	3.2%	2.3
Total	**8.2%**	**22.8%**	**19.6%**	**20.4%**	**14.3%**	**4.2**

Source: Employee Survey (n=3,431).

Employers reported that staff spent 37.7 hours per employee annually on mandatory training, such as Workplace Hazardous Materials Information System (WHMIS), and 28.8 hours per employee on discretionary training.

Informant interviews and the employee survey suggest the Canadian electricity sector faces several unique challenges to ensure an adequate supply of trained workers, including:

- Competition among employers for workers;
- Scope for developing industry-wide training programs;
- Considerable on-the-job training is required in order to become proficient in the job;
- Large-scale retirements/new hires will place considerable pressures on establishments to provide required on-the-job training.

PART FIVE — RETIREMENT PROJECTIONS

Almost all sectors are projected to require significant numbers of new non-support employees. The average age for employee retirement is 56 (according to the results of the Primary Producer and Associate Producer surveys), considerably lower than the Canadian average of 61 years.

- Based on employee surveys, 21.1% of staff expect to retire in five years or less, and 45.5% of staff expect to retire within the next 10 years.
- 60.9% of managers and 46.7% of trades staff are most likely to retire in the next 10 years.
- Among the trades, 53.4% of construction millwright or industrial mechanics and 52.1% of power systems/power station operators plan to retire in 10 years or less.
- 72.9% of utilities managers and 64.7% of supervisors of electricians and power line workers expect to retire in the next 10 years (37.5% and 36.3% within the next five years).
- The impact of retirement is expected to be greatest among transmission companies, where more than half (55.1%) of non-support staff is estimated to retire in the next 10 years.

More than one-half (55.2%) of decided employees stated that they would not work for their current employer past the date they qualified for retirement. However 22% did say they would work for their employer for up to five years past their eligible retirement and 5.3% would stay six or more years.

In addition to continuing to work as an employee, approximately one in 10 employees expressed an interest in working as a contractor post-retirement (12.8%). Flexible work was the most popular way to encourage employees to stay past their planned retirement date. However, age was seen as a limiting factor for physically demanding occupations.

Eligibility to Retire — by Business Line

Business Line	Now	Next 5 Years	Next 10 Years
Generation	3.1%	16.7%	36.3%
Transmission	7.6%	28.6%	50.1%
Distribution	4.5%	9.5%	28.1%
Integrated	12.3%	17.9%	37.6%
Total*	**8.7%**	**17.3%**	**37.3%**

Source: Primary Producer and Associate Producer Survey (n=63) — non-support staff only. Twenty-three producers did not provide data as to number of staff eligible to retire.
* Too few employees were reported for the "other" business line to report this figure.

Based on estimated non-support industry employment of 57,657 employees, retirement projections suggest that the sector will need to fill 8,937 vacancies in the next five years, and more than 17,066 vacancies over the next 10 years.

BEST PRACTICE

Retirement Model

Given the results of the current study that British Columbia faces the largest and earliest concentration of retirements among utilities in Canada, it is not surprising that workforce planning was identified as a priority for BC Hydro.

Retirement modeling undertaken by BC Hydro has proven to be very precise, with 95% accuracy in predicting delayed retirements and 88% accuracy for predicting actual retirements. Modeling has allowed BC Hydro to predict retirement attrition per year and hire apprentices in anticipation of staff needed to replace retiring employees. As a result, a significant number of new apprentices have been hired, and are planned over the next five to seven years to mitigate the risk due to expected future retirement.

Training as an incentive

Training was seen as a viable incentive for workers to remain in the electricity sector. However, training staff on equipment too far in advance of actual field use was not seen as conducive to retention of information. Participants were receptive to online training, but felt that learning and retaining knowledge gained was best accomplished by hands-on training.

Ergonomic equipment and vehicles were considered important, especially for older workers. Acknowledgement or reward for anything developed or invented by staff (particularly engineers) could provide an incentive system and correct processes or components.

Estimated Retirements — by Region

Region	Estimated # to Retire within Next 5 Years	Estimated # to Retire within Next 10 Years
BC/Territories	24.5%	44.5%
MB/SK	18.9%	39.3%
Ontario	14.1%	26.1%
Alberta	12.6%	31.5%
Atlantic	8.7%	23.7%
Total	**15.5%**	**29.6%**

Source: Primary Producer and Associate Producer Survey (n=63) — non-support staff only.
Note: Québec had too few survey responses to report data in these regions.

Succession planning

Overall, 28.1% of primary producers said they did not have or did not know whether they had a succession plan to deal with retirements. While organizations without succession plans expected lower levels of retirement, 66.7% reported that they planned three or fewer years in advance with respect to human resources.

Since the average time for a power line technician to become trained, independent and "valuable" was seen as five to eight years, managers felt that now is the time to promote the industry. Succession planning was not typically seen as occurring.

Implications of retirement

Retirement was seen as one of the top issues for the electricity sector by more than 90% of industry representatives interviewed. Risks due to retirement identified by industry representatives included:

- infrastructure projects slowed or stopped due to lack of human resources;
- reliability lessened, not enough staff to maintain system support;
- increased cost of production;
- greater or earlier reliance on automated systems;
- one company failing to manage the issue can impact all the others (e.g., 2003 NE blackout); and
- influx of new entrants into the workforce may have a negative safety and productivity impact (new workers are less productive and less knowledgeable).

Employees and managers called retaining retiring staff past their expected retirement date a "band-aid solution." The general consensus among employees in focus groups was that few employees wanted to work past age 60. It was felt that "knowledge transfer" could be achieved by using retirees as training or technical advisers. Industry representatives identified phased-in retirement as a promising mechanism to offset the significant effects of future retirement.

One of the challenges to implementing mentoring programs, phased-in retirements and hiring in anticipation of future retirement is cost. As members of a regulated industry, key informants reported not having sufficient financial resources within their operating budgets to solve the impending problem of retirement.

PART SIX — EMPLOYMENT DEMAND

From the perspective of the study, demand for workers was seen to reflect the following considerations:

- demand to fill replacement positions created by retirement or voluntary separation;
- demand to fill new positions that would reflect the general expansion of the industry (demand growth) or work that would be required to replace/upgrade existing infrastructure.

Employment projections

Canadian Occupational Projection System (COPS) — People seeking jobs in engineering and utilities will have a "good" outlook, according to *Job Futures*, a publication derived from the Canadian Occupational Projection System (COPS), maintained by Human Resources and Skills Development Canada (HRSDC). In fact, such individuals should have little problem finding employment. The projected unemployment rate (i.e., 3% or less) for electricity-related occupations also suggests there will be considerable competition from other sectors for workers.

Industry estimates of eabour shortages/future demand — Industry representatives reported shortages of power engineers, nuclear engineers, geological technical engineers, nuclear operators, power line technicians, protection and control technologists.

New sites expected to generate additional employment demand included:

- rebuilding of the Bruce and Pickering nuclear power plants;
- new nuclear reactors in the next five to 10 years;
- construction of the Wuskwatim and Keeyask hydroelectric generating stations;
- the Conawapa Hydroelectric Generating Station to be built by 2015 and Bipole III, to start in 2008, which will be a high-voltage transmission line to carry power south;
- refurbishment of the Toronto hydro plants;
- transmission projects in Alberta.

Staff turnover

Primary producers reported that 4.1% of total staff left the company voluntarily in 2003 (voluntary turnover including retirements). The highest turnover rate was reported among primary producers engaged in the generation of electricity (7.2%).

Industry representatives reported no large barriers to inter-provincial labour mobility, though there were differences reported from province to province (verification of qualifications). Utilities did not lose significant staff inter-provincially or to other countries, but several employee focus groups reported staff leaving to work in the United States.

Potential supply/demand "gaps"

The projected supply-demand "gap" is a hypothetical gap between industry needs and the capacity of education and training systems to produce sufficient qualified graduates. In reality, electricity employers could access other potential labour pools such as:

- existing staff to be promoted into management/supervisory roles;
- foreign-trained workers (recent immigrants);
- trained staff currently working in other sectors;
- use of contract positions for recently retiring staff;

- increased proportion of recent graduates who decide to work in the electricity sector.

Estimated to be as high as 5% of the current workforce, the supply-demand gap suggests there will be an immediate need for employers and education/training institutions to address current and potential hiring needs.

Growth scenarios

Since it is difficult to precisely estimate actual supply/demand scenarios, two alternative growth patterns are projected.

Low growth:

- electricity demand continues to grow at 1.8%/year, worker productivity matches demand growth;
- no additional workforce issues associated with the replacement of existing infrastructure;
- estimates of retirement patterns based on employer estimates of actual retirements (15.5% — next five years; 29.6% — next 10 years);
- need to recruit to fill voluntary separations would be minimal (1%/year);
- electricity sector attracts 5% of engineering graduates and 8% of electricity-related trades/technical graduates.

High growth:

- electricity demand continues to grow at 1.8%/year, worker productivity does not match demand growth (0.8% difference);
- replacement infrastructure demands represents approximately 9% increase in the required workforce by 2010;
- estimates of retirement patterns based on employer estimates of eligible retirements (17.3% — next five years; 37.3% — next 10 years);
- electricity sector attracts 5% of engineering graduates and 8% of electricity-related trades/technical graduates.

Estimated Supply and Demand Gap — High Growth Scenario Engineers and Other Non-Support Positions

Group/Period	Average Annual Estimates	
	2005–2009	2010–2014
Current Total Workforce[1]	58,648	58,668
Engineers	11,525	11,529
Trades/other non-support	47,123	47,139
Estimated Demand — High Growth Scenario[2]		
Engineers	702	767
Trades/other non-support	2,871	3,136
Total	**3,573**	**3,903**
Estimated Supply[3]		
Engineers	65	70
Trades/other non-support	293	291
Total	**358**	**361**
Supply-Demand Gap[4] (per year)		
Engineers	(637)	(697)
Trades/other non-support	(2,577)	(2,845)
Total	**(3,214)**	**(3,542)**
Total Projected Deficit (total for period)		
Engineers	3,185	3,485
Trades/other non-support	12,885	14,225
Total	**16,070**	**17,710**

[1] Total estimated workforce in electrical occupations — primary producers and associate producers, plus approximately 1.8% increase in required workforce year-over-year.
[2] Additional employment growth estimated for demand increases and infrastructure replacement requirements and eligible retirements.
[3] Portion of graduates who secure employment in electricity sector upon graduation as discussed in Part Four.
[4] Difference between estimated demand and current education supply capacity.

The high growth scenario includes several key assumptions:

- That there will be additional growth in employment due to increased demand and infrastructure replacement requirements.
- The proportion of the workforce that will retire is based on the estimate of *eligible retirees*, not the organizations' estimate of actual retirements expected over the next 10 years.

Estimated Supply-Demand Gap — Annual Positions/Year

	2005–2009		2010–2014	
Group	**Low**	**High**	**Low**	**High**
Engineers	399	637	362	697
Trades/other non-support	1,606	2,577	1,478	2,845
Total	**2,005**	**3,214**	**1,840**	**3,542**

The supply-demand gap is estimated to range between 2,005 and 3,214 per year during the next five years, rising to between 1,840 to 3,542 for the period from 2010 to 2014.

Implications for human resources

The predominance of older workers in the industry suggests the need for a pro-active human resource strategy for the sector. Key issues to examine include:

- mentoring/training existing staff for promotion into positions being exited by retiring employees;
- a strategy to increase the number of foreign-born workers with skills in electricity-related occupations via federal immigration programs;
- closer links with post-secondary education institutions;
- marketing and promotion to encourage youth/non-traditional source populations (i.e., females, visible minorities, etc.) to consider a career in an electricity-related trade;
- recruitment strategies targeting on-campus students to choose a career in the electricity sector. In addition, advising students of the availability to transfer existing course credits into an electricity-related discipline.

PART SEVEN — RECRUITMENT

More than 35% of new hires represented replacement positions in 2003. New hires (including staff hired to replace departing employees) represented 3.5% of total non-support staff. New positions as a result of growth (non-replacement) represented 1.3% of total non-support employment.

Recruitment techniques are varied for primary producers surveyed.

- 78.1% frequently use internal company searches to fill a wide variety of positions.
- 65.6% regularly use apprenticeships.
- 62.5% use a company Web site.
- 59.4% have recruitment programs for summer students.
- 56.3% reported involvement in co-op programs.
- No primary producers reported using human resource centres for recruitment.

Of primary producers surveyed, 81.3% indicated they hired summer students, 78.1% hired co-op students, 56.3% hired apprentices and 18.6% hired interns in 2003. Primary producers reported hiring 1,394 summer students in 2003 across all provinces.

Recruitment of immigrants — A majority of industry representatives felt that immigrants would be a significant portion of future workers. Challenges of hiring workers from other countries included recognition of foreign certifications/training, and language barriers. Managers indicated that recruiting employees from the U.S. would be too expensive.

Recruitment of Aboriginal workers — Industry representatives had mixed opinions about how Aboriginal workers would fit into future

labour requirements. Approximately one-third stated they had a program or were investigating how to recruit Aboriginal workers. A lack of Aboriginal students in engineering or other technical education may inhibit Aboriginal employment in the electricity sector.

Recruitment of women — A number of challenges to recruiting women were reported including:

- women's perception of the industry;
- physical demands of trade positions;
- perceptions within the industry by trades people;
- a low number of women entering training programs to prepare for employment in the electricity sector.

Some key informants identified innovative ways to attract women:

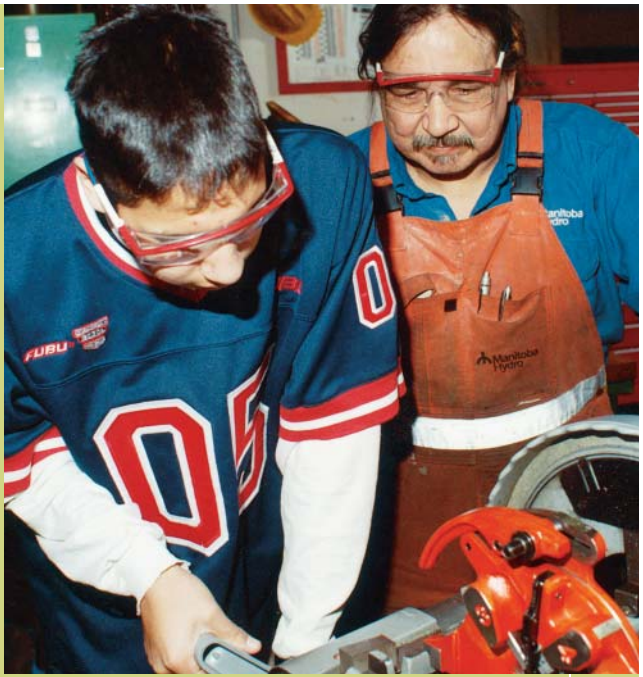
- scholarships for educational/training programs;
- hire women in management positions.

A "family-friendly" work environment and its positive effect on job satisfaction could be used to promote the sector to women.

Employee satisfaction

There is a high level of satisfaction with those who have made the electricity sector their career choice. Overall, 21.7% of employees rated the sector as "excellent" compared to other industries and 46.9% rated the sector as "good."

BEST PRACTICE



Aboriginal Recruitment Initiatives

Manitoba Hydro was looking for innovative ways to address Aboriginal employment equity issues, to tap into a potential labour pool and build mutually beneficial relationships with Aboriginal communities. Employment goals for Aboriginal peoples have been set at 12% corporate-wide and 37% in the North by 2007.

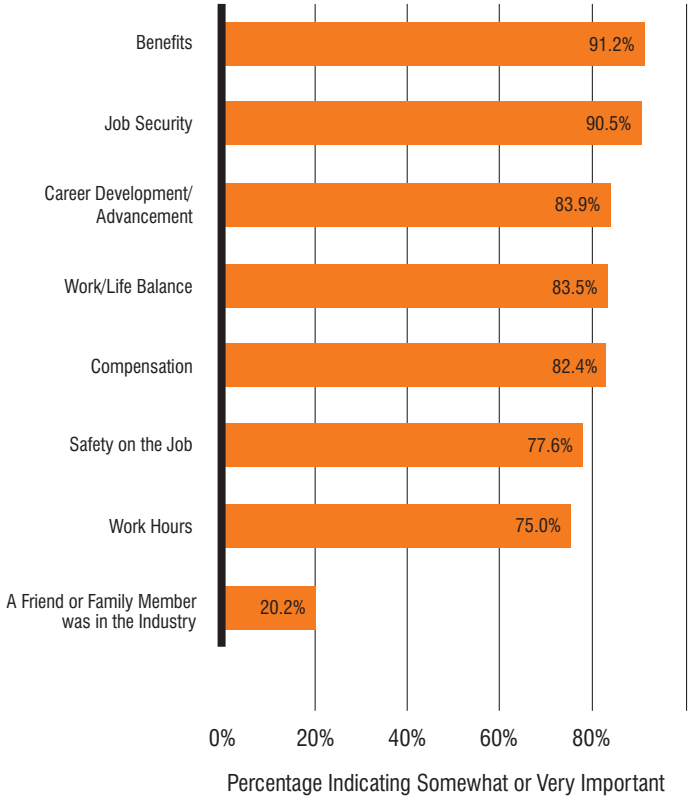
Manitoba Hydro has introduced a number of different initiatives to address the issue:

Aboriginal Pre-Placement Training Initiative *— To aid individuals who lack specific academic requirements for entry into trades training programs.*

"Building the Circle Camp" Initiative *— Modeled after a camp called "Girls Exploring Trades and Technology" run by the Manitoba chapter of Women in Trades and Technology. The philosophy is that the earlier one can introduce girls to all the opportunities open to them in engineering, technology and trades, the better.*

Participation in Other Aboriginal Employment Initiatives *— Consistent with Manitoba Hydro's commitment to Aboriginal employment equity in the ongoing operations of the Corporation, the company is committed to increasing Aboriginal participation in future development projects through its involvement in the Hydro Northern Training and Employment Initiative.*

Factors Important in Recruiting Employees to the Electricity Sector



Source: 2004 Canadian Electricity Sector Study Employee Survey (n=3,514).

Recruitment to the industry

Most employees in focus groups felt the electricity sector was an attractive industry in which to work. Earning expectations, job security and benefits were seen as factors to influence people to enter the field. Results of the employee survey matched focus groups, with the most important factors to recruit staff to the industry being good benefits (91.2%) and job security (90.5%).

Youth perceptions of the industry

"People don't notice until the lights go out."

In general, youth consulted had little or no awareness of the electricity sector as a career option, a feeling confirmed by employees. Young people said teachers generally did not discuss careers in the electricity sector. Focus groups felt that shift work and safety risks were factors that might keep young workers from entering the sector.

Perceptions of the electricity sector were varied and frequently inaccurate among youth. Salary and benefits were seen as being among the most positive aspects of employment, and the electricity sector was seen as a good opportunity for individuals who liked "hands-on" work.

Youth suggested a number of avenues to promote the electricity sector to young people, including:

- Advertising in print/radio/electronic media that targets youth and women, showing the interesting or exciting aspects of the sector;
- Promoting the sector in schools (career fairs, work planning courses);
- Providing teachers and guidance counselors with more information about the career to disseminate to students.

Implications for the sector

Industry representatives felt that sharing training requirements with post-secondary training/educational institutions would help offset the cost of providing training to new recruits.

School counselors were felt to be good potential partners for promoting careers in the power industry. However, misperceptions among counselors of requirements for employment in the industry resulted in inappropriate referrals.

PART EIGHT — POLICY OPTIONS FOR THE CANADIAN ELECTRICITY ASSOCIATION

Potential Policy Options that Could be Pursued by CEA — Unweighted Average

Option	*Not Important*	*Neutral*	*Important*
Promotion of the electricity industry to youth	4.4%	8.5%	77.5%
Standardization/certification across Canada of electricity sector occupations	14.6%	15.5%	56.5%
Development of an industry-funded training centre	17.2%	14.2%	54.7%
Certification of foreign workers	11.3%	23.2%	50.9%
Strategies for keeping older workers employed in the electricity industry	18.8%	22.3%	47.9%
Strategies for recruiting non-traditional workers (e.g., women, Aboriginal people, etc.)	16.2%	28.0%	46.8%
Developing specific human resource tools for employers (e.g., workbooks with resources for hiring, etc.)	25.3%	21.2%	43.0%
Targeting of the Employment Insurance (EI) system to train workers	24.7%	26.7%	33.7%
Centralized Industry Human Resource Sector Council	23.0%	29.0%	27.7%

Note: percentages do not total 100% due to Don't Know/No Opinion responses not displayed.
n = 28 to 29 for primary producers; n = 25 to 26 for associate producers; n = 30 to 31 for stakeholders.

Commenting on several identified policy options, stakeholders said it is very important for the CEA to take a lead role in promoting the electricity industry to youth. A significant proportion (77.5%) of stakeholders noted that it would be important or very important for the CEA to promote the industry to youth.

PART NINE — NEXT STEPS

Without electricity, we're all in the dark. While responsibility for some action items has been explicitly addressed in the document, it remains incumbent upon organizations and agencies to implement those strategic options within their jurisdiction or sphere of influence.

Undoubtedly, industry and the Canadian Electricity Association have crucial roles as catalysts for the entire electricity sector. However, they cannot achieve their goals alone. They need the consistent and innovative support and assistance from labour, educators, federal and provincial policy makers and regulators that can only be achieved through establishing strong partnerships based on long-term commitments to a common goal.

Steering Committee recommendations

Retirement, combined with re-skilling requirements due to technology change, will require utilities, labour groups, educators, and government to collaboratively develop human resource strategies to maintain a viable electricity sector in Canada. Based on study findings, four main recommendations and 17 strategies have been developed in consultation with the CEA Steering Committee.

1) Develop strategies to mitigate risk to the industry due to the aging workforce.

Strategies:

1. Collaborate with government, safety and regulatory organizations to improve awareness of the need for financial resources to hire, train and mentor workers to ensure an adequate supply of trained employees. Hiring replacement staff should occur ahead of retirements.
2. Explore methods to retain older workers as mentors/trainers to facilitate "knowledge transfer" from retiring staff to new recruits.
3. Continue to promote employee retention within the sector by providing training opportunities, competitive compensation/benefits and by encouraging staff safety.
4. Establish a mechanism to monitor the number of contractors working for the industry, a significant source of contingent labour for the industry.
5. Develop an "early warning" data collection system to identify occupations where utilities are reporting difficulty finding new recruits.
6. Promote the need for better succession planning in the industry, particularly for critical engineering, technical, trades, and management occupations.

2) Develop a collaborative, cross-industry strategy for providing training to prospective and existing staff in the electricity sector.

Strategies:

1. Work with educators, governments, and employee groups to increase opportunities for training on modern systems and technologies.
2. Establish and/or expand industry-wide or regional training centres that can be used by multiple employers.
3. Improve access to education and training for rural, remote, interprovincial and Aboriginal populations.
4. Increase the places/seats in educational institutions for fields where there is expected to be a skill shortage or increased demand.

3) Adopt a targeted marketing and promotion campaign to attract individuals from qualified groups of potential new entrants.

To attract the "best and brightest," marketing should focus on individuals that have the qualifications to enter the industry/occupation.

Strategies:

1. Collaborate with educators, federal immigration services and safety organizations to draw attention to the need for workers in electricity as a "critical infrastructure" industry.

2. Encourage teachers and guidance counselors to disseminate information about the industry and prerequisite course requirements to parents and eligible students.

3. Promote attractive aspects of the industry, such as pay scales, benefit packages, opportunities for promotion/advancement, training available.

4. Expand recruitment among non-traditional sources of labour such as Aboriginal workers and women.

5. Promote increased standardization of credentials, to enable increased labour mobility, particularly international labour mobility.

4) Establish a mechanism to ensure greater collaboration between utilities and other groups in the electricity industry.

Over 50% of industry representatives stated there was a need for greater collaboration among companies, between companies and union organizations, and within the industry.

Strategies:

1. Investigate the possibility of forming a Sector Council through HRSDC's partnership program. Provide more information about the difference between an industry association and a sector council, including benefits.

2. Collaborate with key groups in the industry to establish the economic, safety, performance, and other implications of future staff turnover identified in this report.

ACKNOWLEDGEMENTS

The Canadian Electricity Sector Study was made possible by the following.

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

This study was funded in part by the Government of Canada's Sector Council Program and by the Canadian Electricity Association.