

ONTARIO COLLEGE ENERGY PROGRAMMING

Recommendations

Prepared for



Ontario Centres of
Excellence

Where Next Happens

and



Building bright futures

**Prepared by
Bold Advantage Strategies and Events**

May 20, 2008

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1. **Executive Summary**

Energy conservation is the focus of many advertising campaigns and new strategies and resources are being developed daily. The importance of energy is understood, particularly as it relates to the future. Given its significance, it is alarming that the energy sector will suffer a skills shortage unless changes are made. The Ontario Centre of Excellence for Energy (OCEE), in consultation with the Electricity Sector Council (ESC) undertook a survey of the colleges and roundtable discussion help address this shortage. The goals of this initiative were to:

1. provide an opportunity for colleges, industry, unions, and other relevant energy groups to interface with one another;
2. identify current programming and gaps;
3. identify industry concerns and how to better serve constituents; and
4. enhance current programming.

The survey results summarized current college priorities and helped identify some key issues which were provided to participants in the form of a Discussion Paper, see Appendix A. These priorities and issues were the focus of a one-day roundtable discussion held March 27, 2008 with representatives from 18 of Ontario's Colleges and key individuals from energy groups such as the Ontario Power Authority and Ministry of Energy. A full participant list is attached as Appendix C.

The recommendations from the roundtable are:

1. Identify best practices of current programming.
2. Identify and establish program and technical standards.
3. Evaluate apprenticeship programs and those that need updating.

Ontario College Energy Programming – Recommendations

4. Inventory current college training needs and equipment and identify what needs updating based on Integrated Power System Plan (IPSP) and sector needs.
5. Provide more opportunities for networking and resource sharing.

To ensure that these goals are met, these tasks should be delivered either by a team of individuals in the energy and electricity sector such as OCEE, ESC and Colleges Ontario or a committee that includes representatives from such organizations.

2. **Background**

The labour shortage in the energy sector is well documented in several key publications¹²³⁴. The OCEE and ESC developed a strategy to help identify key issues and recommendations to help avert the skills shortage and ensure Ontario's colleges are offering the right and most effective energy programs that take into account the IPSP for future planning.

The strategy involved surveying the colleges and key partners and then providing them with a discussion paper to help delve into the findings and issues at a roundtable. The original survey, see Appendix E, was sent to all the colleges in Ontario. Initially, only 17 responded but after the roundtable on March 27, responses had been received from 23. The updated results for energy programs are included as Appendix D. Because some of the results occurred after the roundtable, some of the responses may be skewed as the respondents had more information than those that completed the survey prior to the meeting. This is relevant because some of the respondents admitted at the meeting, and it was obvious from some of the survey responses, that not all colleges had the same definition for "energy programming".

The colleges were each given an opportunity to address what programming they currently offer, identify key issues and what methods they use for future planning. Please see the Discussion Paper for a more detailed analysis of these results. Participants were then divided into three groups with a very specific and different question to be addressed by each.

¹ Ontario's Looming Labour Shortage Challenges, *The Conference Board of Canada*, September 25, 2007.

² The Challenge Ahead: Averting a Skills Crisis in Ontario, *Ontario's Workforce Shortage Coalition*.

³ The Report of the Agency Review Panel on Phase II of its Review of Ontario's Provincially-owned Electricity Agencies, November 2007.

⁴ Human Resource and Skill Needs Facing the Ontario Electricity Sector, *Electricity Sector Council Report*, November, 2007.

The roundtable agenda is included as Appendix B. The broad categories for each question were networking and partnerships, the IPSP and staying up to date, and addressing workforce needs province-wide. It is important to note that each group had a diverse mixture of participants from colleges and other relevant groups.

Because the initial survey results indicated that there seemed to be a lack of understanding of the IPSP or perhaps little importance placed on it, some time was also spent summarizing the key findings. For many, the information was new and for others, it still lacked a fundamental understanding of the key issues faced by the colleges.

3. **Key Findings**

The participants had a very common message although there were some anomalies. Many expressed frustration over the fact that while there had been meetings, surveys and initiatives in the past to address the skills shortage, many of the colleges' key needs were still not being addressed. While the colleges agree that they have a large role to play, some of the common difficulties identified include:

- Generalist programs don't attract students.
- The gap in program planning and delivery make it difficult to respond quickly to industry needs.
- Sector jobs need to be more interesting.
- Students seem to be unaware of the careers that are available to them.
- Applicants seem to be lacking the pre-requisite math credits.
- Need more programs like co-ops to get students into industry.
- Needs identified in IPSP are not translating into current job opportunities for graduates.
- Colleges play a role with supply but supply is difficult to quantify.
- Equipment is sorely out of date.

All the colleges seem to be plugged into the regional needs of their industry and had established or refined programming to help address those needs. The regional needs are not always a match to what is identified in the IPSP.

Many of the colleges identified the Apprentice programs as some of the most effective and well-subscribed programs that they offered; however,

many were already at capacity. The issue of supply came up on various occasions. The ESC already has plans to launch a survey in the Fall of 2008 to address supply.

The current offering of programs covers a wide expanse as is evidenced by the list in Table 1 of Appendix A. Although there are some consistencies, it became clear that each college had a different definition for their programs, particularly in relation to the energy and electricity sector. While some standardization may be possible, the programs are reflective of the regional needs and preferences and the goal should be to ensure that they are ideally defined for the regional sector needs.

4. **Recommendations**

The skills shortage as it relates to the energy sector will only be addressed once the key groups come together on a consistent basis to discuss the issues, develop strategies, share resources and common practices. It is therefore critical for the colleges and key energy and electricity groups to continue to dialogue. The desire to do so was clearly articulated by the participants and it is no surprise that this is one of the key recommendations of this report.

The participants agreed that many of the activities and recommendations would need to be carried out by an independent or current coordinating organization, team or committee. This team could be responsible for helping to review current programming and establish some benchmarks, best practices and standards. The team should comprise individuals with an interest or focus in the energy and/or electricity sector. Some suitable organizations include but are not limited to Colleges Ontario, the Electricity Sector Council and the Ontario Centre of Excellence for Energy.

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Ensuring that the colleges understand and support the IPSP will be an important part of the strategy moving forward. As part of this, the colleges can play a key role in providing feedback about the gaps that need to be filled in order to begin addressing the needs of the IPSP and the sector, such as the need for updated equipment and training needs.

The survey, discussion paper and roundtable were just the beginning of a concerted effort to meet the needs of a growing energy sector. To meet the needs of this sector, we recommend that an energy team be mandated with the following responsibilities:

- Identifying best practices of current programming.
- Identifying and establishing program and technical standards.
- Evaluating apprenticeship programs and those that need updating.
- Creating an inventory of current college training equipment and needs and identifying what needs updating based on the IPSP and sector needs.
- Providing more opportunities for networking and resource sharing.

The team that is established or appointed should ensure that its primary task be to deliver an action plan that identifies the goals above and strategies to meet those goals within a specific timeline.

APPENDIX A

**ONTARIO COLLEGE
ENERGY PROGRAMMING**

Discussion Paper

For Roundtable on the Energy Sector for Ontario Colleges- March 27, 2008

Prepared for



Ontario Centres of
Excellence

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Background

Within the last few years, several key reports have explicitly identified the shortage of skilled workers and the looming resource requirement gap in the energy sector as key economic obstacles for Ontario. These issues are critically intertwined and Ontario colleges are playing a key role in addressing the challenges. Given the gravity of the situation, we must step back and identify if what we are doing is working and learn from one another to move forward with a more aggressive and cohesive strategy.

The Ontario Centre of Excellence for Energy (OCEE), in consultation with the Electricity Sector Council (ESC) undertook a survey of the colleges to identify current energy programming, enrolment levels, strategic priorities, industry involvement, and external influencing factors and programs. At the time that this discussion paper was written, 17 of Ontario's colleges had completed the survey and responses from the remaining 7 are still anticipated. The data from the outstanding surveys and the outcomes of the roundtable discussion will be incorporated into a final paper which will be used by the ESC to create a national human resources strategy for the electricity sector.

The purpose of this discussion paper and roundtable is to:

1. provide an opportunity for colleges, industry, unions, and other relevant energy groups to interface with one another;
2. identify current programming and gaps;
3. identify industry concerns and how to better serve constituents; and
4. enhance current programming.

Recent reports offer many recommendations leading to new programs for awareness, attraction, retention, training, and apprentice programs. These reports together with the findings of the survey and the roundtable discussion will offer colleges with an excellent opportunity to evolve programs and collaborate for greater impact on the skills shortage and resource gap.

Current Energy Programming

Ontario's Workforce Shortage Coalition notes that Ontario's colleges have introduced 200 new or substantially new revised programs in the last two years.⁵ The OCEE survey results show that the energy programs currently offered at Ontario colleges ranged from none to very extensive programs. Table 1 shows all the programs that were identified and the number of colleges that offer the specified program. Programs that were sufficiently similar were grouped.

Table 1: Inventory of Ontario College Energy Programming

Program	#
Air Conditioning/Refrigeration	3
Alternative Energy Technologies	2
Architectural Technology	2
Automation/Instrumentation	1
Biotechnology	1
Chemical Engineering	1
Chemical Production and Power Engineering Technician	1
Chemical Production and Power Engineering Technology	1
Construction	2
Electrical Apprenticeship	5
Electrical Engineering Technician	6
Electrical Engineering Technician – Power Generation	2
Electrical Engineering Technician – Process Automation	1
Electrical Engineering Technician – Process Automation and Trades	1
Electrical Engineering Technology – Alternate Energy	1
Electrical Engineering Technology Control Systems	5
Electrical Engineering Technology – Process Automation	1
Electrical Engineering Technology	1
Electrical Power Generation	1
Electrical Pre-apprenticeship	1
Electrical Techniques	3
Electro-mechanical	1
Electronics Engineering Technology	1
Energy Management	1
Energy Systems Engineering Technician	2
Energy Systems Engineering Technology	4
Environmental	1
Gas Technician	2
Gas and Oil Burner Technician	2
Industrial Electrician	1
Instrumentation Engineering Technician	2
Instrumentation Engineering Technology	2
Mechanical Engineering Technician - Manufacturing	1
Mechanical Techniques – Industrial Maintenance (Millwright)	1

⁵ The Challenge Ahead: Averting a Skills Crisis in Ontario, Ontario's Workforce Shortage Coalition, p. 6.

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Mechanical Techniques – Machine Shop	1
Motive Power	1
Power Engineering	2
Powerline Technician	1
Solar Wind Energy	1
Sustainable Energy and Building Technology	1
Utilities Systems Operator	1
Other	
Hands-on Solar Workshop	1
Hands-on Wind Workshop	1
Centennial Energy Institute	1

While some enrolment numbers are low, colleges identified that program enrolment was generally growing or at capacity. The only program that was identified as having a shrinking enrolment was in chemical engineering. The Report of the Agency Review Panel on Phase II of its Review of Ontario’s Provincially-owned Electricity Agencies identified increasing qualified apprentices as a method of addressing the workforce gap⁶. All colleges with apprenticeship programs noted that enrolment was at capacity. It is also important to note that the majority of programs listed deal with electrical engineering yet the Report states that, “Overall, a smaller share of graduates of electricity courses at colleges are working in their field after graduation than in other programs, and those employed report lower job satisfaction”.⁷ It is evident that we must delve deeper into the programs offered and assess whether we have the right mix and what can be done to make the programs and graduates more successful.

Strategic Priorities

The survey responses about strategic priorities related to energy programming demonstrated some consistencies and some oversights. Some answers were very specific and include:

- establish a partnership with Hydro One
- build an Energy Research Centre
- build Urban Ecology Centre
- install a green wall

⁶ Report of the Agency Review Panel on Phase II of its Review of Ontario’s Provincially-owned Electricity Agencies, November 2007, p. 36, 41-42.

⁷ Ibid, p. 37.

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- expand programs based on SSFC Strategic Priorities 2005-2010

Some common responses include:

- responding to market/community
- adding new programs and upgrades to existing programs
- exploring additional training and diplomas
- focus on energy and energy programs some of which were identified as sustainable energy, energy management, alternative energy, resource conservation and management

The most interesting response was one that was least offered: collaboration with business and university. If colleges are to take a more active role in addressing the skilled worker shortage and energy gap, more collaboration needs to occur to ensure the relevancy of programming.

Regional Developments

Colleges all seem to agree that regional developments and other jurisdictions have a significant impact on their programming. This was also evident when they considered their strategic priorities. Some comments that are note-worthy for discussion include:

- Colleges are in competition with one another
- Have not seen a large employment growth in the energy sector
- Colleges need to respond to their region first

Integrated Power System Plan

Colleges were polled about the impact that Ontario Power Authority's Integrated Power System Plan (IPSP) has on their college program planning. The results were more interesting than we had anticipated. Only 3 respondents indicated that it has a very significant impact while one respondent indicated that it has no impact at all. However, 8 respondents did not know what the impact was. There could be several reasons for this response but it is evident that further discussion needs to occur to ensure that

colleges understand the IPSP and how it impacts on program planning. The demand pressures on the Ontario electricity industry are summarized on page 11 of the Electricity Sector Council's November 2007 Report.

Working Together

The Conference Board of Canada's 2007 Report on Ontario's Looming Labour Shortage Challenges stresses that colleges have a major role to play in skills enhancement and accreditation. Part of this process involves being responsive to workplace needs, engagement of individuals, existence of substantial collaboration and adequate resources for sustainability.⁸ The report further stresses that "colleges could establish linkages with both the public and private sector, to ensure their continuing role as knowledge specialists."⁹ Colleges cited increased coordination with industry as the 2nd highest requirement to be able to add new electricity programming and/or take additional students in each program.¹⁰

The survey responses provided a clear indication that the primary method of communicating with industry was through advisory committees while a select few also mentioned clusters and municipal initiatives. Only one respondent noted university-college and college-industry collaboration. It is important to understand why more colleges did not identify collaboration as part of the process for informing their programming. Organizations such as Ontario Centre of Excellence for Energy offer college programs that can broker the right relationships and provide an infusion of funds to help ensure programs are industrially-relevant and successful. Colleges should assess what programs they are involved with and/or identify the reasons that they are not taking advantage of existing programs. Better energy programming will result in a more competitive Ontario and we all have a part to play, together.

⁸ Report on Ontario's Looming Labour Shortage Challenges, The Conference Board of Canada, 2007, p. 3.

⁹ Ibid, p. 27.

¹⁰ Human Resource and Skill Needs Facing the Ontario Electricity Sector, Electricity Sector Council Report, November, 2007, p.15.

APPENDIX B

Program: Roundtable on the Energy Sector for Ontario Colleges

When: Thursday March 27, 2008

9:45am-4:00pm

Where: Ontario Investment and Trade Centre

250 Yonge Street, 35th Floor

Toronto, Ontario

M5B 2L7

Voice: 416-313-3400 or 1-800-819-8709

Directions and Parking: <http://www.2ontario.com/meet/>

Time	Item	Role
9:45-10:00am	Registration	---
10:00-10:10am	Welcome from Ontario Centres of Excellence Goals for the day	Nicole Geneau and Nathan Fahey
10:10-10:20am	Brief from Electricity Sector Council	Catherine Cottingham
10:20-10:30am	View from the energy sector industry	Three industry representatives
10:30am-12:30pm	Five-minute briefs from all college representatives	Ontario college representatives
12:30-1:30pm	Lunch and Networking	---
1:30-2:30pm	Discussion breakout session <i>- Each of the three breakout groups are assigned a different topic noted below</i>	Facilitation: Robert Stasko, Nathan Fahey, Jenni Myllynen
2:30-3:00pm	Break and Networking (while facilitators prepare findings summary)	---
3:00-3:45pm	Report from facilitators on main findings from breakout sessions and opportunity for questions and comments	Facilitation: Robert Stasko, Nathan Fahey, Jenni Myllynen
3:45-4:00pm	Adjournment and expectation for proceedings document	Nathan Fahey

Welcome from Ontario Centre of Excellence for Energy (Nicole Geneau)

5 minutes

- Message of thanks
- What OCE does- funding and partnerships between industry, universities, colleges, research hospitals, investors and governments

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Goals for the day (Nathan Fahey)

5 minutes

- Introductory remarks on ground rules for the day
- 5. Provide an opportunity for colleges, industry, unions, and other relevant energy groups to interface with one another
- 6. Identify industry concerns and how to better serve constituents
- 7. Enhance current programming
- 8. Explore ways for OCEE to develop more research-to-commercialization projects with colleges
- 9. Proceedings formed into second discussion paper that will inform Electricity Sector Council's work on developing a national electricity sector human resources strategy

Introduction of Electricity Sector Council

10 minutes

- Electricity Sector Council introduction
- Connectivity project
- Building findings from the day into discussion paper to inform national HR strategy

View from the energy sector industry

10 minutes

- These briefs are short, but intended to offer a broad overview of priorities for skills and training in the energy sector. Representatives will have a more direct impact in the discussion breakout sessions.
- 3-minute brief from **Michael Stewart, Director, Ministry of Energy**
- 3-minute brief from **Debra Carey, Power Workers' Union**
- 3-minute brief from **David Butters, President, Association of Power Producers of Ontario (APPrO)**

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Five-minute briefs from all college representatives

2 hours

- These briefs are also short, but intended to offer a broad overview of priorities for skills and training in the energy sector. Representatives will have a more direct impact in the discussion breakout sessions.
- Five minute oral presentations from college representatives could include:
 - program expansions under consideration
 - how new curriculum is developed and approved
 - how they interface with industry to understand trends
 - where they see opportunity for growth and retraction with respect to the energy sector

Lunch and Networking

1 hour (depending on the morning program being on schedule)

Discussion breakout session

1 hour

- Breakout into three groups to discuss three topics. Each group is assigned one topic.
 1. How can Ontario Centre of Excellence for Energy, colleges, industry, associations, and trade unions establish more effective partnerships?
 2. How can OCEE, industry, associations, and trade unions support colleges in staying up-to-date on which energy sub-sectors need programming attention? How does Ontario Power Authority's Integrated Power System Plan fit into this?
 3. How can colleges collaborate to meet energy sector workforce needs province-wide?

Report from facilitators on main findings from breakout sessions and opportunity for clarifications/questions/comments from participants at large

45 minutes

Adjournment and expectations for proceedings document

15 minutes

APPENDIX C

Roundtable Participant List

COMPANY/ACADEMIA	LAST NAME	FIRST NAME
Algonquin College	Finnagan	Steve
Association of Power Producers of Ontario	Butters	Dave
Bold Advantage Strategies & Events	Williamson	Guida
Canadian Union of Skilled Workers	Wabb	John
CanSIA	Johnston	Wes
Centennial College	Aznavour	Simmon
Centennial College	Sinnock	Herb
Conestoga College	McClements	Mike
Confederation College	Vieira	Joe
Durham College	Nouroozifar	Mona
Electricity Sector Council	Cottingham	Catherine
Electricity Sector Council	Tetzlaff	Martin
Fanshawe College	Makaran	John
Fleming College	Harvey	Blane
Fleming College	Sillberg	John
Georgian College	Derrick	Jodi
Georgian College	Emptage	Bob
Georgian College	Playne	Jack
Humber College	Embree	Rick
Humber College	Taweel	Robert
Hydro One	Yoanidis	Vivian
International Brotherhood of Electrical Workers	Hurley	Clark
La Cité collégiale	Guevremont	Jean Paul
La Cité collégiale	Surprenant	Gilles
Lambton College	Reiser	Henry
Leapfrog energy	Da Cunha	Ivor
Loyalist College	McDermott	Mike
Ministry of Energy	Stewart	Michael
Ministry of Energy	Annis	Kristyn
Ministry of Energy	Wong	Elaine
Mohawk College	Brimley	Bill
Niagara College Canada	Hewitt	Kevin
Northern College	Hanson	Tori
Ontario Centres of Excellence	Nantel	Marc
Ontario Centres of Excellence	Noguera	Crystal
Ontario Centres of Excellence	Fahey	Nathan
Ontario Centres of Excellence	Geneau	Nicole
Ontario Centres of Excellence	Woolard	Jessica
Ontario Centres of Excellence	Stasko	Robert
Ontario Centres of Excellence	Manor	Ran
Ontario Centres of Excellence	Myllynen	Jenni
Ontario Centres of Excellence	McGillivray	Dan
Ontario Energy Association	Robinson	Gregor
Ontario Power Authority	Richardson	Mary Ellen

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Ontario Power Generation
Power Workers Union
Seneca College
Sheridan College
St. Lawrence College
St. Lawrence College

Mejaski
Carey
Humber
Arthur
Phin
Young

Michelle
Deb
Bill
Michael
Russ
Don

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APPENDIX D

Table 1: Inventory of Ontario College Energy Programming - updated

Program	#
Air Conditioning/Refrigeration	3
Alternative Energy Technologies	2
Architectural Technology	3
Automation/Instrumentation	1
Biotechnology	1
Building Engineering Systems Technology	1
Building Environmental Systems	1
Chemical Engineering	2
Chemical Production and Power Engineering Technician	1
Chemical Production and Power Engineering Technology	1
Chemical Techniques – Environment	1
Computer Engineering Technology	2
Construction	3
Construction Engineering Technician – Civil and Mining	1
Construction Engineering Technologist – Civil and Mining	1
Electrical Apprenticeship	5
Electrical Engineering Technician	8
Electrical Engineering Technician – Power Generation	2
Electrical Engineering Technician – Process Automation	1
Electrical Engineering Technician – Process Automation and Trades	1
Electrical Engineering Technology – Alternate Energy	1
Electrical Engineering Technology Control Systems	5
Electrical Engineering Technology – Process Automation	1
Electrical Engineering Technology	2
Electrical Power Generation	1
Electrical Pre-apprenticeship	1
Electrical Techniques	5
Electrician Construction and Maintenance	1
Electro-mechanical	2
Electro-Mechanical Engineering Technician – Robotics	1
Electronics Engineering Technology	2
Energy Management	1
Energy Systems Engineering Technician	2
Energy Systems Engineering Technology	4
Environmental	1
Gas Technician	2
Gas and Oil Burner Technician	2
Industrial Electrician	1
Instrumentation Engineering Technician	2
Instrumentation Engineering Technology	2
Mechanical Engineering Technician - Manufacturing	2
Mechanical Engineering Technology	1
Mechanical Techniques – Industrial Maintenance (Millwright)	1
Mechanical Techniques – Machine Shop	1
Motive Power	1
Power Engineering	2
Powerline Technician	1
Pre-Apprenticeship Certificate – Industrial Electrician	1

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Solar Wind Energy	1
Sustainable Energy and Building Technology	1
Utilities Systems Operator	1
Other	
Hands-on Solar Workshop	1
Hands-on Wind Workshop	1
Centennial Energy Institute	1
Photovoltaic Technology	1
Geo Exchange Installers Training	1
Introduction to Wind Power	1
BioMass	1

* Shaded items indicate changes after initial survey results.

APPENDIX E:

College Energy Programming Survey

1. Please identify yourself so we can follow up.
2. Please list all energy programming that already exists in your college.
3. Please indicate the enrolment levels in these programs in relation to other programs (i.e. growing, at capacity, shrinking, etc.).
4. What are your college's strategic priorities with respect to programming related to the energy sector?
5. How do regional developments and other jurisdictions affect your college programming?
6. How significantly does the Integrated Power System Plan factor into college program planning? (Very, Somewhat, Not at all, Don't know)
7. How does your college communicate with industry to help inform their programming? (i.e. through advisory committees, etc.)
8. Please share any other thoughts or input you have on the topic of energy programming.