ENGINEERING ACCESS PROJECT

FINAL REPORT
SURVEY OF IMMIGRANTS WITH ENGINEERING BACKGROUNDS SETTLING IN ONTARIO, ENGINEERING EMPLOYERS AND COMMUNITY SUPPORTS

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THE COUNCIL FOR ACCESS TO THE PROFESSION OF ENGINEERING

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EXECUTIVE SUMMARY

In recent years Canadian immigration has undergone some rapid, large-scale changes. Consequently immigrants arriving after 1984 are more numerous, possess higher skills and credentials, and are more concentrated in certain occupational groups and countries than in previous decades. A significant proportion of these skilled immigrants appear to be unable to convert their foreign qualifications into jobs commensurate with their training. Immigrants with engineering backgrounds from non-traditional source countries are a dominant occupational group among these. Ontario receives sixty percent of skilled immigrants coming to Canada and is an excellent study of the challenge of immigrant access to the engineering profession.

In June 2003, CAPE (the Council for Access to Professional Engineering later renamed the Council for Access to the Profession of Engineering) initiated 'Engineering Access', an Ontario-based community action research project. This is a multifaceted project, the overall objective of which is to achieve the better integration of immigrants with engineering backgrounds into the engineering labour market in Ontario. It is funded by Canadian, Heritage, in-kind contributions of CAPE members and Human resources skills development which funded the development of the database and its analysis reported here. The data analysis comprises four components:

- Analysis of skills and credential of 1003 immigrants with engineering backgrounds providing a comprehensive picture of the human resources represented by this community;
- An inventory of employers of licensed engineers and an analysis of the salaries, types and number of engineering positions available in Ontario;
- Labour market information providing a comparison of skills and competencies of immigrants with engineering backgrounds to the licensed engineers in Ontario as well as comparisons of employment rates and salaries earned by these two groups; and
- An inventory of licensing and community supports for immigrants with engineering backgrounds.

Having involved both engineers and employers in the development of the database, this analysis will be made available on the CAPE website www.capeinfo.ca with the objective of assisting both. This will also be of use to those in the implementation of the "labor force adjustments" outlined in the HRDC criteria for Labor Market Partnerships:

- By directing skilled engineers to the areas where demand for their specific skills exists;
- By directing employers attention to the skills and competencies available in the Ontario pool of immigrants with engineering backgrounds; and
- Using the data gathered and analyzed to support the multi-stakeholder roundtable employment strategy that is being developed by CAPE to integrate immigrants with engineering backgrounds into the Ontario workforce.

1. INTRODUCTION

As stated by CIC[1] immigration to Canada has undergone a number of rapid and large-scale changes in recent years. In particular, immigrants are more numerous, possess higher skills and credentials, and are more concentrated in certain occupational groups and countries than in previous decades. However a significant proportion of these skilled immigrants appear to be unable to convert their foreign qualifications into jobs commensurate with their training. Engineers are a dominant occupational grouping within the natural and applied science skill type and recent trends show that increased inflows of skilled worker principal applicants intended to work in these occupations.

In June 2003, CAPE (the Council for Access to Professional Engineering later renamed the Council for Access to the Profession of Engineering) initiated 'Engineering Access', a community action research project. A multifaceted project, the overall objective of which is to achieve the better integration of immigrants with engineering backgrounds into the engineering labour market, this initiative is:

- Creating a multi-stakeholder roundtable of internationally educated engineers, employers, professional associations, regulatory bodies, credential recognition services, educational providers and community-based service providers;
- Conducting participatory research with both employers and immigrants with engineering backgrounds (IEBs) to identify systemic barriers;
- Through the mechanism of the multi-stakeholder roundtable developing an employment strategy to break down barriers and to create greater access to the field of engineering for immigrants with relevant credentials;
- Facilitating the leadership of IEBs and employer champions; and
- Developing a comprehensive inventory of the skills of IEBs and engineering employers, and identifying the labor market demands of the profession.

The project has two funding sources – Human Resources Skills Development Canada and Canadian Heritage. Part of the funding is also being provided by CAPE members in the form of in-kind contributions. The outcomes reported here relate to the last of the five components of 'Engineering Access' listed above. This is funded by Human Resources Skills Development Canada through its Labour Market Partnerships Unit and in-kind contributions of the CAPE members. This component constitutes the development of a comprehensive information database about the engineering labor market needs, the skills of immigrants with engineering backgrounds, engineering employers and possible gaps between supply and demand. This information has been analyzed in this report which is also being made available through our website; www.capeinfo.ca as well as the portal accessible from the website of CAPE trustees for the 'Engineering Access' project, The Council of Agencies Serving South Asians (CASSA); www.cassa.on.ca.

[1] CIC (2003) Immigrant Occupations: Recent Trends and Issues.
http://www.cic.gc.ca/english/research/papers/occupations/occupations-toc.html

2. SKILLS AND CREDENTIALS OF IMMIGRANTS WITH ENGINEERING BACKGROUND

a. Literature Review

A preliminary literature review revealed evidence on the employment situation, experience and skills of immigrants with engineering or other professional backgrounds was mostly anecdotal and needed further investigation, data collection, and assessment to develop a factual and comprehensive picture of the human resources represented by immigrants with engineering backgrounds (both tapped and untapped). The existing raw-data collection pools relating to immigrants lacked coordination; so, if one organization has evaluated an applicant's credentials for immigration purposes, another organization held information about the applicant's arrival, a third had partial information about where this individual settled, and the regulator only had information on the IEBs who had applied for a license. These lacunae presented problems in the coordination of information necessary for understanding the needs of immigrants with engineering backgrounds (IEBs) necessitating a comprehensive data collection component.

b. Data Collection Methodology

A structured, action-based and participatory methodology for outreach and data collection based on the systematic, integrated and strategic approach (SISA) developed by the author[2] previously was adopted. This began with a situation analysis that revealed the presence of several ongoing initiatives on employment access issues facing IEBs and that identified the main entry points for information on IEBs as:

- Community engineering associations representing IEBs
- Immigrant settlement services for IEBs
- Events and job search related forums targeting IEBs

The entry points provided useful conduits for IEB outreach under 'Engineering Access' and defining a spatial and temporal framework for outreach. Focus groups were used to introduce the 'Engineering Access' project and identify issues facing IEBs. Questionnaires based on the findings were used to collect data in subsequent focus groups and this was entered into the database manually. With volunteer assistance on-line data collection was initiated through the CAPE website in March 2004. This report contains an analysis of 1003 IEBs from Toronto, GTA Ottawa, Hamilton, Windsor, Kingston, Oshawa and Niagara, carried out between November 2005 and January 2006. It includes statistics on countries of experience, educational levels, fields of specialization, years of experience, type of employers worked for, skills acquired and level of pay since arrival in Ontario and Canada.

[2] Bambrah, G. K. 1989. A systematic Approach to Appraisal/Evaluation of Civil Engineering Projects, with Special Emphasis on Technology, PhD Thesis, Loughborough University of Technology

c. Immigrants with Engineering Backgrounds (IEBs) - Countries of Experience

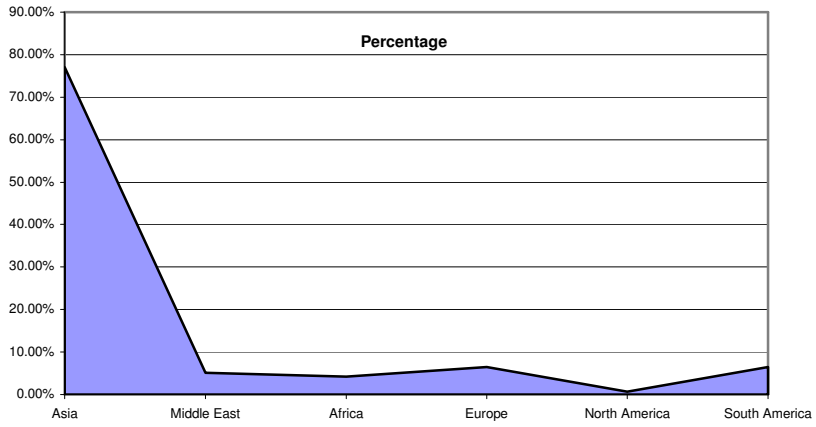
The total survey sample size is 1003 immigrants with engineering backgrounds drawn from 73 Countries. The regional distribution of these countries based along the same lines as that adopted for Statistics produced by Citizenship and Immigration Canada (CIC) source areas [3] is shown in Table 1:

Table 1: Regional Distribution of ITEGS Survey.

Region	Number of Countries	Number of Members	Percentage
Asia	17	773	77.07%
Middle East	5	51	5.08%
Africa	18	42	4.19%
Europe	16	65	6.48%
North America	2	7	0.70%
South America	15	65	6.48%
Total	73	1003	

This is also presented in Graph 1 and is followed by a graphical comparison with national immigration trends in Canada in 2001.

Graph 1: *Distribution of ITEGs Survey Sample by Source Region*



d. Comparison of Sample Source Countries and National Source Countries

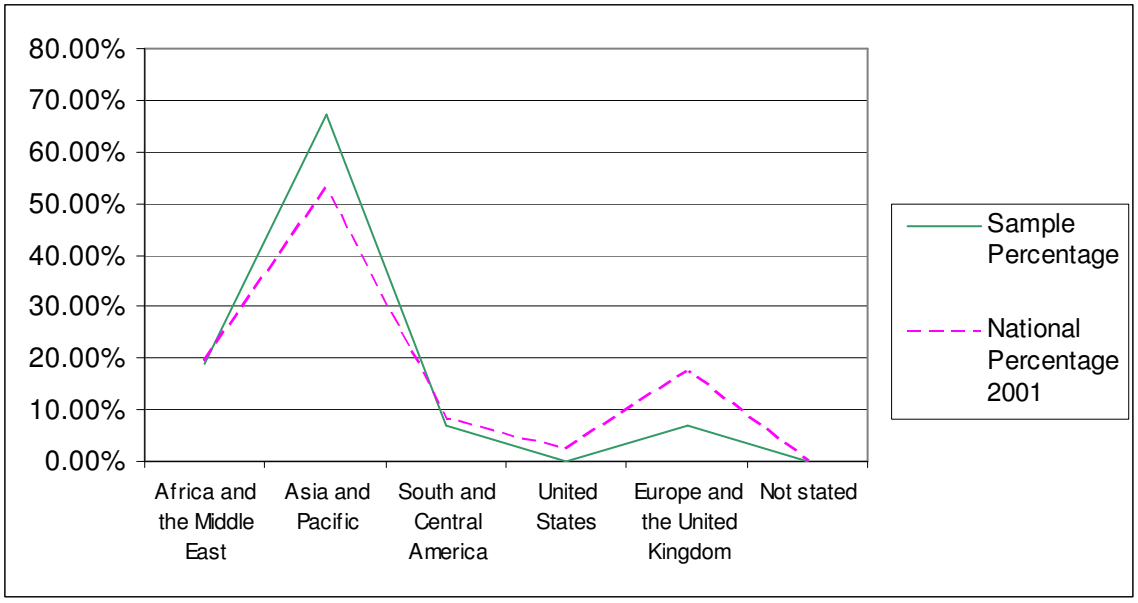
A comparison of the sample data with that of the National Immigration Source Region trends tabulated below is presented in Table 2 and Graph 2

[3] CIC (2004) Facts and Figures 2004, Immigration Overview: Permanent Residents http://www.cic.gc.ca/english/pub/facts2004/permanent/10.html

Table 2: Immigrant Source Regions 2001 (Statistics Canada).

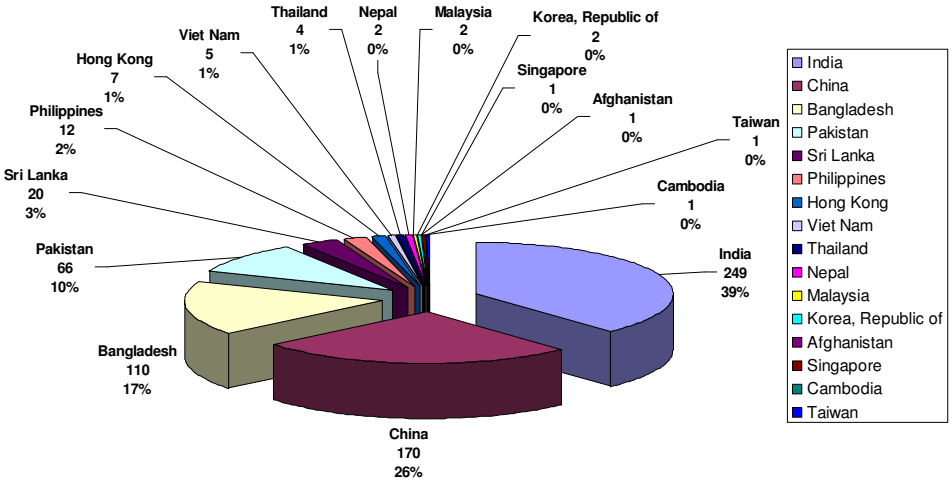
Region	Sample Percentage	National Percentage 2001
Africa and the Middle East	20.34%	19.20%
Asia and Pacific	66.23%	53.01%
South and Central America	7.09%	8.04%
United States	0.00%	2.35%
Europe and the United Kingdom	6.34%	17.26%
Not stated	0.00%	0.13%
Total	100%	100%

Graph 2: Comparison of Sample Data to National Statistics of 2001

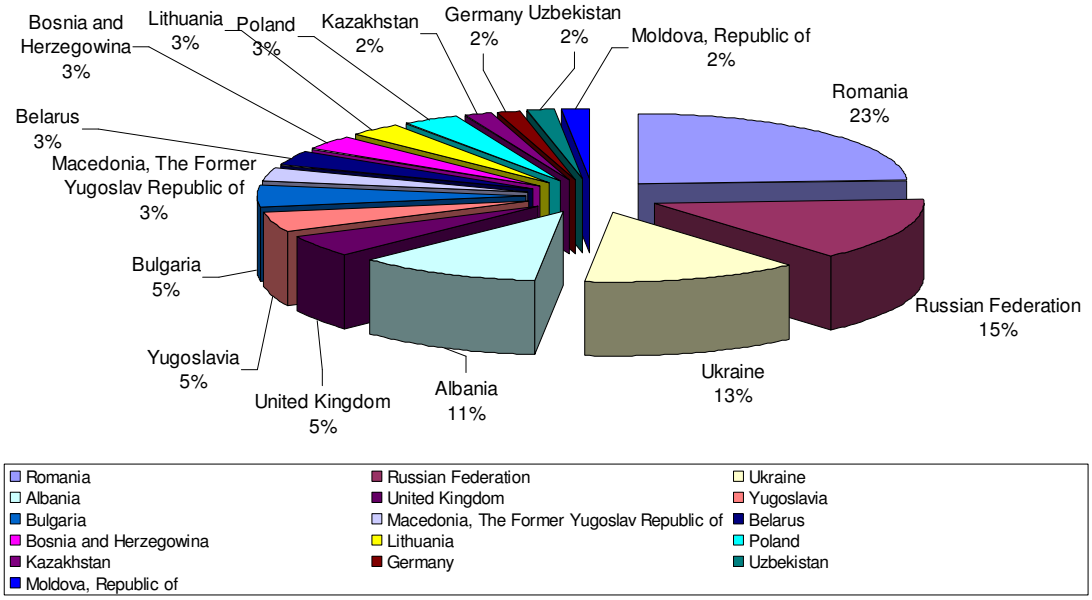


The survey sample distribution by region compares well with the 2001 national distribution trend for immigration to Canada except that a greater percentage of IEBs come from Asia-Pacific regions, a shortfall of IEBs from United States and a smaller percentage from Europe. An investigation to assess if this is due to bias in the sample or if it reflects the actual proportion of IEBs from these regions shows that this distribution is supported by the findings reported in a CIC research report [1] that recent trends show that Asia as a whole is clearly the main region of origin of most recent immigrant engineers, with smaller, but significant numbers also coming from Eastern Europe.

The pie charts that follow provide more detailed information on the countries and numbers of IEBs from each of these in the sample for the three key regions of Asia and Pacific, Europe and South and Central America.

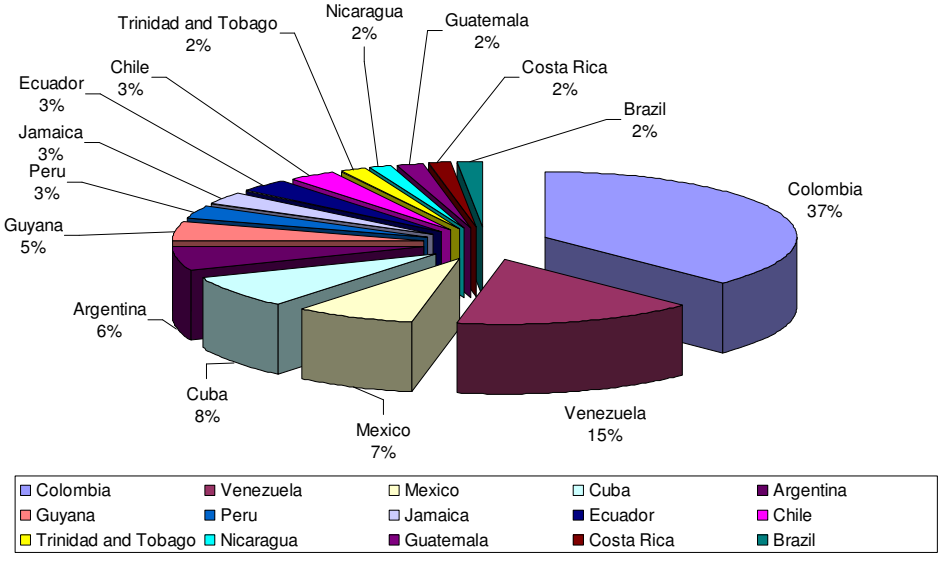


Pie Chart 1: Asian and Pacific Regions (December 2005)



Pie Chart 2: Asian and Pacific Region (December 2005)

Pie Chart 3: South and Central America (December 2005)



e. Educational Levels

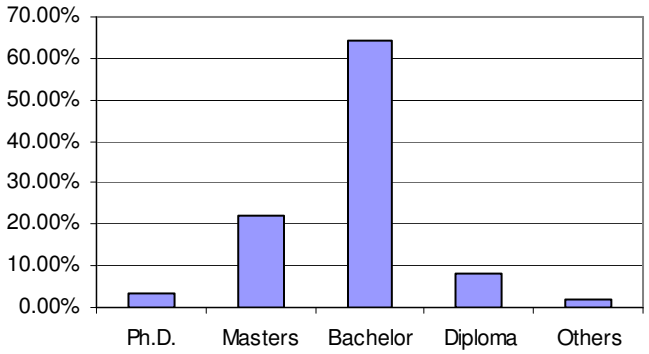
The analysis of education levels of IEBs surveyed is shown in Table 3 and Bar Chart 1.

Table 3: Qualifications of the IEBs

Degree	No.	Percentage
Ph.D.	42	4.26%
Masters	276	28.02%
Bachelor	796	80.8%
Diploma	103	10.46%
Others	21	2.13%

Note: 18 members did not indicate their Qualification

Bar Chart 1: Analysis of Academic Qualification



The survey shows that over 80% of the IEBs surveyed held a Bachelors Degree, 4% held doctorates and over 28% held a Masters degree or higher. This compares with the picture for post-secondary education in Ontario presented in Table 4 below:

Table 4: Percentage of Enrolment in Graduate Studies in Ontario Universities 1995-96

University	Ph.D. as % of Full Time Equivalents(FTEs)	Combined Master & Ph.D. (% of FTEs)	Total FTEs
Toronto	5.30	13.00	41,943
Queen's	4.14	11.86	14,574
McMaster	3.61	10.36	15,029
Waterloo	3.57	8.57	16,595
Guelph	3.54	10.22	12,089
Ottawa	3.26	12.62	18,926
Carleton	2.49	10.20	16,128
Western	2.37	8.60	24,298
York	2.02	7.22	30,581
Windsor	0.97	5.41	11,866
Wilfrid Laurier	0.47	8.77	6,684
Brock	0.00	5.98	8,129
Lakehead	0.00	3.22	6,479
Laurentian	0.00	1.90	6,082
Trent	0.00	1.82	4,656
Nipissing	0.00	1.59	2,098
Ryerson	0.00	0.00	15,300
Source David C. Smith (1997), Table 4, Framework for a Research Policy for Ontario - Discussion Paper www.edu.gov.on.ca/eng/document/discussi/research.html			

f. Fields of Specialization

The survey also collected data on the engineering fields corresponding to those identified in the National Occupations Classification that IEBs were trained in. This data is presented in Table 5 below. This shows that over 60% of the IEBs surveyed were trained in the five major engineering disciplines; Civil engineering, electrical and electronics engineering, mechanical engineering, engineering managers and industrial and manufacturing Engineering while technicians and technologists make up about 10%.

Table 5: Fields of Experience and Training

Field of Engineering	Percentage
1. Civil Engineering	14.91%
2. Electrical and Electronics Engineering	14.84%
3. Mechanical Engineering	13.99%
4. Engineering Managers	9.74%
5. Industrial and Manufacturing Engineering	8.04%
6. Other Professional Engineering, n.e.c.	4.48%
7. Electrical and Electronics Engineering Technologists and Technicians	3.86%
8. Chemical Engineering	3.79%
9. Computer Engineering (Except Software Engineering)	3.32%
10. Civil Engineering Technologists and Technicians	3.09%
11. Software Engineering	3.09%
12. Engineering Inspectors and Regulatory Officers	2.40%
13. Metallurgical and Materials Engineering	2.24%
14. Industrial Engineering and Manufacturing Technologists and Technicians	1.93%
15. Petroleum Engineering	1.93%
16. Mechanical Engineering Technologists and Technicians	1.78%
17. Engineering Officers, Water Transport	1.55%
18. Aerospace Engineering	1.47%
19. Stationary Engineering and Auxiliary Equipment Operators	1.24%
20. Geological Engineering	0.93%
21. Mining Engineering	0.93%
22. Railway and Yard Locomotive Engineering	0.34%
23. Air Pilots, Flight Engineering and Flying Instructors	0.08%

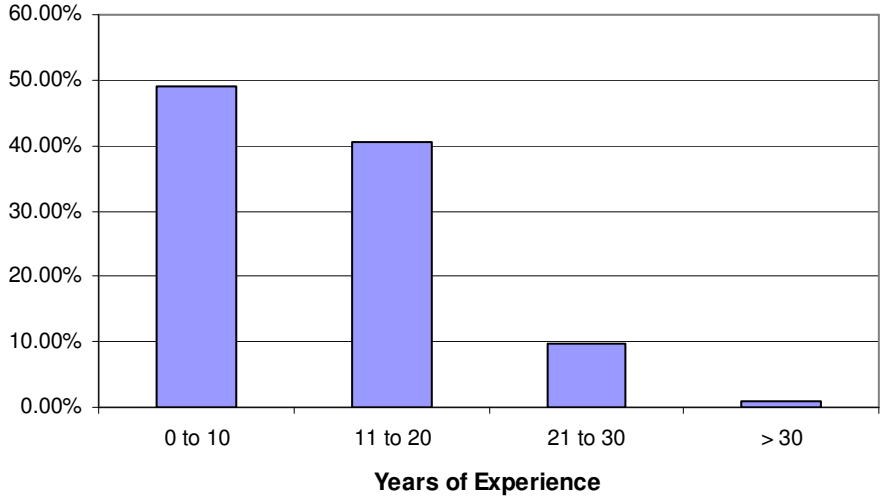
g. Total Number of Years of Engineering Experience

The survey also captured data on the total number of years of engineering experience that the IEBs held. The analysis of this data is contained in Table 6 and captured visually in Bar Chart 2.

Table 6: Number of years of Engineering Experience

Number of years of Engineering Experience	Number	Percent of Total
0 to 10	491	48.95%
11 to 20	405	40.38%
21 to 30	97	9.67%
> 30	10	1.00%
Average years:	12.11	100%

Bar Chart 2: Number of years of Engineering Experience.



The survey sample shows that 49% of the ITEGs surveyed had less than 10 years experience, while 51% had over 10 years of working experience. Around 11% had more than 20 years experience. The average length of working experience held by the IEBs is 12.11 years

h. Type of Employers

Out of the 1003 IEBs on the CAPE database, just over 300 submitted detailed resumes online. A Keyword analysis of these resumes shows that the IEBs worked predominantly with four types of employer categories as shown in Table 7 below.

Table 7: Types of Employers Worked For Before Arriving In Canada

Types of Employers	No of Occurrences
Consultants	88
Contractors	125
Laboratories	39
Universities	10

i. Type of Experience Acquired

Table 8 below presents the information abstracted from over 300 resumes on the types of engineering skills and competencies acquired by these IEBs. Given that the average length of working experience of the IEBs exceeds 10 years, many of them have multiple types of working experience with different types of employers

This analysis focussed on functional competencies that it would be normal for an engineer to acquire over the course of her/his career path within a conventional engineering environment. The analysis covers six main disciplines and a typical range of functional competencies.

Table 8: Types of Experience in Six Key Disciplines

Types of Specialization	Number of IEBs in Discipline					
	Chemical	Civil	Computer	Electrical	Mechanical	Industrial
Commissioning	6	2	0	13	19	2
Construction	4	82	0	24	30	2
Costing	2	10	0	3	6	0
Design	8	74	2	34	46	7
Estimating	0	21	1	7	5	0
Execution	5	26	0	12	17	2
Feasibility Studies	2	10	0	4	8	1
Implementation	4	11	2	15	5	1
Instrumentation and Controls	0	1	0	7	8	0
Maintenance	5	36	2	24	25	1
Project Control	0	3	0	0	0	4
Project Management	2	41	0	16	24	0
Planning	9	45	2	24	26	8
Process Design	4	0	0	0	4	0
Process Development	2	0	0	0	3	0
Production	11	10	0	8	27	10
Procurement	2	8	0	10	14	1
Quality Control	6	29	0	4	10	4
Tender Document Preparation	0	21		5	2	1
Teaching	3	7	0	3	4	3

j. Typical Skills and Competencies

A more in-depth analysis based on skills and engineering competencies was also carried out using a skills based keyword search on the 300 resumes. Although the results of this analysis were useful this level of information was not easy to abstract from resumes even with a strategic keyword search. Table 9 below presents details on the competencies and skills that were established on the basis of the strategic keyword search.

k. Length of Stay in Canada

As mentioned earlier the survey of IEBs was through outreach involving focus groups with members of community engineering groups and newcomer employment support providers. Consequently as shown in Table 10, the first analysis showed that nearly 50% of the IEBs surveyed comprised newcomers (those who had been in Ontario for less than 2 years). However once the on-line random survey was initiated the picture began to change so that the number of newcomers in the sample began to decrease. There are just less than 17% newcomers in the latest analysis as shown in Table 10.

Table 9: Technical competencies and soft skills

Type of Technical Skills	Typical Technical skills	Associated Typical Soft Skills	No of Occurrences
1. Research and Development	Knowledge management, academic Research, applied research, proposal development	Inquiring, innovative, creative, academic, report writing, originality	8
2. Planning	Proposal development, Client management, information management, Resource management, forecasting and operations research	Preparing activity, resource and tome schedules, Technical, economic etc analysis, appraisal, evaluation, information and recording, progress monitoring and corrective action.	161
3. Project Supervision	Claims and arbitration, Construction supervision, Contract documentation, Cost quality and budgetary control	Coordination of contractors and consultants, teamwork, communication,	88
4. Feasibility Studies	Academic/Research, Site investigations, data logging, conceptualizing, codes and regulations, Design calculations, technical reports, appraisal/evaluation	Analysis, appraisal, evaluation, conceptualizing, visual and written communications, presentations, information collection and analysis	20
5. Process Development	Site specific investigations, conceptualizing, codes and regulations, design calculations, technical reports,	Analysis, appraisal, evaluation, conceptualizing, visual and written communications, presentations, information collection and analysis	5
6. Design	Site investigations, data logging, conceptualizing, codes and regulations, Design calculations, Design Drawings, technical specifications, design reports Contract documentation and law, tendering.	Analytical, independence, team building, teamwork, client liaison, creativity, mathematical, innovative, meticulous, visual communications, report writing, computing.	267
7. Process Design	Conceptualizing, codes and regulations, design calculations, design Drawings, technical specifications, design reports Contract documentation and law, tendering, supervision, operation Contract documentation,	Analytical, independence, team building, teamwork, client liaison, creativity, mathematical, innovative, meticulous, visual communications, report writing, computing. System Design	10
8. Instrumentation and Controls	Information management, Instrumentation, circuitry, digitization, Interference analysis,, workplace safety,	Systems analysis, operations research, troubleshooting, communications, technical reporting and documentation	29
9. Costing	Information management, quantity surveying, project management, Tendering/bidding	Estimating, information collection and processing, numerate, computing and software	23
10. Estimating	Take out quantities from the drawings to prepare BOQ, Claims and arbitration	Analytical, computing, meticulous, information management	41
11. Tender Document Preparation	Contract documentation, Bidding, Bid evaluation,, site meetings	Preparing RFP, RFQ, special conditions of contract and material specifications	150
12. Construction	Construction management and supervision, Plant management, materials procurement and control, activity scheduling and programming, cost and manpower management	Leadership, supervision, record-keeping, troubleshooting, administration, teamwork, communication. initiative, record keeping, progress monitoring and reporting	131
13. Execution	Client needs assessment, identification of project partners, quality control, scheduling and time management, budgetary control, Materials specification, Claims and arbitration	Supervision, teamwork, leadership, monitoring, meetings and communications, troubleshooting, scheduling, organizational, meeting deadlines, resource management	60
14. Implementation	Claims and arbitration, manpower, materials and plant management, extrusion, Plant Installation,	Supervision, teamwork, meetings and communications, troubleshooting, scheduling, organizational, meeting deadlines, resource management, progress monitoring and reporting	75
15. Production	Process control, Manpower management, Plant and assembly line control, Plant Installation, Product Design Analysis	Supervision, teamwork, meetings and communications, troubleshooting, scheduling, organization, meeting target, resource management, materials control and management, Systems control	61
16. Project Control	Claims and arbitration, Time, cost and quality control	Manpower and activity Scheduling, quality assurance	8
17. Procurement	Materials identification, purchasing, plant acquisition and hiring, manpower planning and recruitment	People skills, information and data collection and analysis, quotations, services contracting, interpersonal skills, sales and marketing	44
18. Start-up and handing over	Plant Installation, operations, maintenance, preparation of manuals, training	Leadership, teamwork, communication, documentation, troubleshooting, independent worker	65
19. Maintenance	Process control, training, manpower control, Root cause analysis	Troubleshooting, Leadership, supervision, teamwork, management	150
20. Quality Control	Product Analysis, quality assurance,	Systems control, investigative, recording and communications, interpersonal skills	83

Table 10: Length of Stay in Canada

Duration of Stay	Apr-04		Nov-04		Apr-05		Jan-06	
	Number	%	Number	%	Number	%	Number	%
Under 6 months	71	13.50%	53	7.57%	26	3.19%	0	0.00%
Between 6 months and 1 year	95	18.06%	121	17.29%	96	11.76%	17	1.71%
Between 1 year and 2 years	92	17.49%	152	21.71%	220	26.96%	147	14.74%
Between 2 year and 4 years	173	32.89%	246	35.14%	314	38.48%	398	39.92%
Over 4 years	95	18.06%	128	18.29%	160	19.61%	435	43.63%
Total	526	100%	700	100.00%	816	100%	1003	100.00%

l. Employment Status of Immigrants with Engineering Backgrounds

An analysis of the employment status of the 1003 IEBs by the source region is contained in Table 11 below: Where the sample size justifies this analysis, the country level analysis is also included.

Table 11: Employment Status by source Regions

Region	Unemployed	Working in a professional field	Working but in another field
Asia	52.39%	17.34%	30.27%
- *India*	43.58%	20.62%	35.80%
- *China*	65.50%	11.70%	22.81%
North America	57.14%	42.86%	0.00%
Europe	66.67%	13.64%	19.70%
Latin America and the Caribbean	70.15%	5.97%	23.88%
Middle East	71.15%	3.85%	25.00%
Africa	73.17%	2.44%	24.39%
Total	**56.36%**	**15.21%**	**28.43%**

An analysis of language and employment among three categories of source countries; English speaking, French speaking and those where neither English nor French is a national language is presented in Table 12. The employment status among IEBs improves if the source country is English speaking.

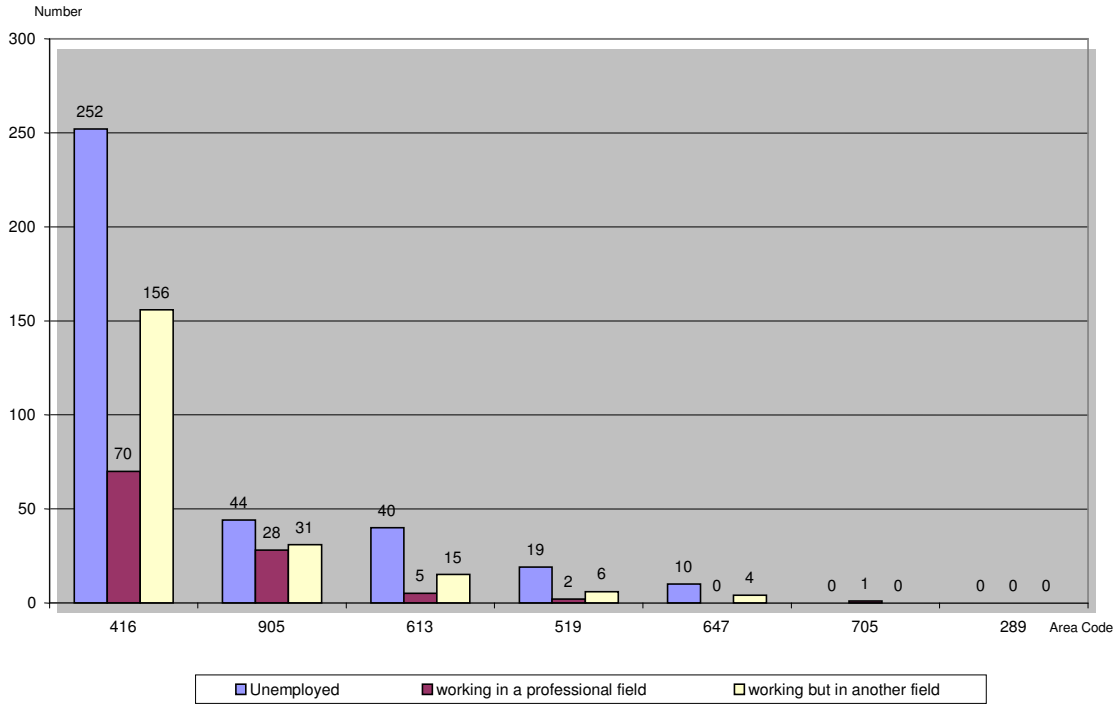
Table 12: Bearing of Language spoken by the IEBs on their Employment Status

Language Skill	Unemployed	Working in a professional field	Working but in another field
English Speaking IEB	46.68%	18.51%	34.81%
French Speaking IEB	100.00%	0.00%	0.00%
Foreign Language Speaking IEB	65.68%	11.58%	22.74%

Bar Chart 3 shows the employment situation of immigrants with engineering backgrounds across Ontario based on the telephone codes. This shows that the general

trend of low employment in engineering jobs and high unemployment rates among immigrants with engineering backgrounds are prevalent right across Ontario.

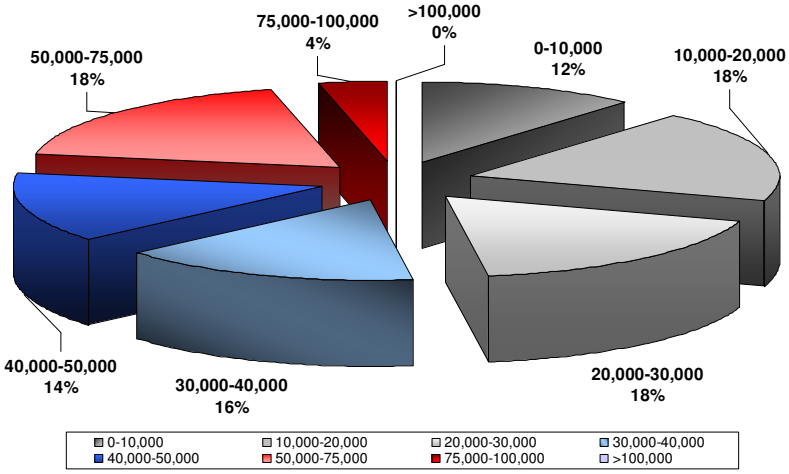
Bar Chart 3: Employment Status versus Area Code



m. Salary Survey – Immigrants with Engineering Backgrounds

Since an individual's salary information is a sensitive parameter particularly in the case of a community that appears to have poor market access, the first questionnaire excluded any attempt to obtain this data. Having built an online database membership of over 1000 immigrants with engineering background the Council for Access to the Profession of engineering has established itself as a legitimate voice for this community. A secondary survey to collect this data successfully elicited 136 responses from members already on the database and of the less than 50% of the sample who were employed. Pie Chart 4 shows an analysis of this salary survey.

Pie Chart 4: Incomes of Employed Immigrants with Engineering Backgrounds (November 2005)



Graph 3 below shows the analysis of incomes of IEBs employed in engineering and those working in non-engineering jobs.

Graph 3: Incomes in Engineering Verses Non-Engineering Jobs (November 2005)

3. ENGINEERING EMPLOYERS IN ONTARIO

a. Background

The national occupations classification (NOC) was identified as a useful index against which to develop a comparison between employer needs and skills and competencies of immigrants with engineering backgrounds. Using the NOC information, the functional levels, commensurate skills and attributes (soft Skills) required within this classification under the 213, 214, 223 and 224 codes assigned to the engineering, engineering technicians and technologist occupations were derived.

The survey questionnaire to collect data on their skills, education and experience attributes based on this has been answered by 1003 IEBs in Ontario. This survey data has provided a general understanding of the participant's country of origin, fields of specialization, education and qualifications, previous employment and experience, employment status and experience since arrival in Canada as reported above. For a comparison of this data to that of Canadian Engineers, it is necessary to have parallel information on the latter.

The initial approach adopted was to interest employers in informational interviews to obtain this parallel information but this proved futile as employers were not interested in an association of immigrants that they assumed was headhunting for its members. Consequently it was decided that employers should be engaged in a questionnaire survey to collect parallel data from the mainstream engineering fraternity on the qualifications, skills and attributes of those working as professional engineers, engineering technicians and engineering technologists in Ontario.

b. Employer Survey

The questionnaire contained a preamble stating it sought to collect data on the participant's professional development highlighting skills developed, experience, workplace culture in Canada and language of instruction /use with the appropriate confidentiality provisions stating that neither the participants name nor that of his/her employer were required. It required some written answers. The idea was to profile how skills developed at each stage by the Canadian professional engineer related to conventional career development paths adopted by IEBs. Not a single Canadian engineer out of approximately 150 who were contacted was willing to answer this questionnaire.

A mainstream engineering recruiter who had experience of working with numerous engineering employers volunteered to assist with this survey. The recruiter started off by modifying the length of the original questionnaire and limiting the answers by multiple choices. He then tried to elicit a response to this from 100 engineers holding professional engineering positions across a number of engineering disciplines. Not one of them responded to the questionnaire but several responded by stating that they did not see any point in an immigrant association inquiring about Canadian Skills. They also pointed out that what needed to be done was for the immigrant association to ask the Canadian Engineers to identify what skill sets the immigrants needed to acquire. The recruiter prepared a third questionnaire in consultation with an employer focusing on deriving the skills and competencies that Canadian engineers and employers required of the immigrants. Out of the 50 engineers and employers approached with the third questionnaire, only nine responded and all nine were immigrants themselves. The questionnaire and responses elicited are contained in Appendix 1 to this report. The analysis of the main concerns of the nine respondents is summarized in Table 13.

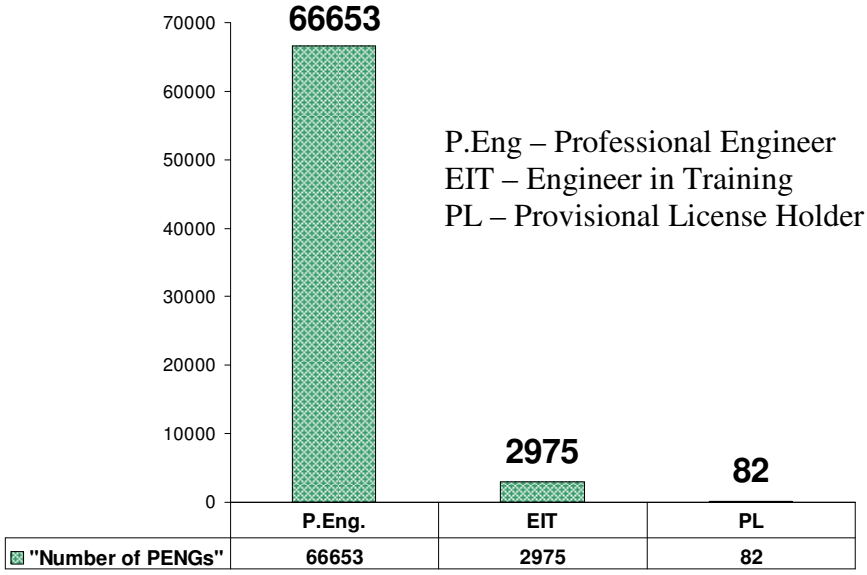
Table 13: Employer Response to Questionnaire on skills requirements for Internationally Trained Engineering Graduates

Issue	**% response**
Employers confirming they would hire IEBs with or without a Professional License	100%
Employers offering professional Development or training courses	66.7 – 73.3%
Employers offering language training	0%
Hiring process driven by project managers, recruiters and advertising	73.3%
Hiring process driven by Human Resources	33.3%
Referrals encouraged	66.7%
International clientele and employees from same countries	66.7%
Emphasis in hiring process: • Education and training 67.7 to 73.3 % • Project specific experience • Communication skills	 66.7 to 73.3 % 100% 87-100%
Percentage of respondents for whom English was a second Language	66.7%
Percentage who felt Language skills held them back	11.1%
Percentage who ranked their own communication skills as: • Excellent • Good • Fair	 44 -55% 11 -33% 11-22%
Percentage recommending English language training for IEBs	100%
Percentage recommending policy and guideline support for IEBs by all levels of Government	44 -67%
Percentage willing to equate Canadian credentials with other credentials	44%

c. Engineering Employers in Ontario

Engineering is regulated by the Professional Engineers Ontario (PEO) through a tightly enforced licensing system. Using information publicly available on the PEO website[4] a detailed analysis of the number of professional engineers and their employers was carried out**.** The total number of PEO members comprises the categories shown in Bar Chart 5.

Bar Chart 5: Professional Engineers of Ontario Membership (October 2005)



The total number of professional engineers and the number of companies employing them in Ontario are provided in Table 14 below. Approximately 7000 professional engineers are employed in other provinces of Canada, the rest of North America or other Countries. It was not possible to ascertain the employers for about 11,000 Professional engineers who are members of PEO.

Table 14: Total Number of Companies (October 2005)

Number of professional engineers employed	**Number of engineering employers**	**% of Total number of companies**	**Total number professional Engineers Employed**	**% of Total number of employees**
More than 500	4	0.02%	3186	6.49%
101 - 500	43	0.22%	8996	18.33%
51 - 100	57	0.29%	4077	8.31%
11-50	440	2.23%	8593	17.51%
6-10	120	0.61%	767	1.56%
2-5	3149	15.95%	7513	15.31%
1	15935	80.69%	15935	32.47%
Total	**19748**		**49067**	

[4] Professional Engineers Ontario (October 2005), Member Directory
http://www.peo.on.ca/MemberRegistry/NewCheckMember.cgi

The type of employer, their share of employment of professional engineers and size of the employer measured by the number of professional engineers employed is shown in table 15.

Table 15: Typical Employers and Employment Share (October 2005)

Number of professional engineers employed	**% of Total number of employees**	**Typical Employers in Category**
More than 500	6.49%	• Power Generators • Vehicle Manufactures • Information technology
101 - 500	18.33%	• Universities • Government Federal and Provincial) • Cities • Power Generators • Vehicle Manufacturers • Plane Manufacturer
51 - 100	8.31%	• Universities • Consulting • Corporations • Cities
11-50	17.51%	• Colleges • Banks • Consulting • Information technology support • Construction
6-10	1.56%	• District School Boards • Materials testing • Industrial • Information technology support
2-5	15.31%	• School Boards • Recruiters
1	32.47%	9. Employment support 10. Industrial and commercial 11. Sales and marketing 12. Small building projects 13. Property Management

d. Number of Engineering Vacancies

Two well recognised job search engines available to the IEBs are Monster and Workopolis. The latter has a clearly defined component for Canada while Monster tends to be North American. Workopolis draws its job bank from all the major Canadian newspapers and media as well as a significant number of regional publications. An evaluation of the quantitative aspects of engineering vacancies on the Workopolis engine on a random day in January 2006 is captured in Tables 16, 17 and 18 below. This is broadly representative of the engineering positions available rather than the absolute number of vacancies. Nevertheless it provides some insight into the proportion of engineering vacancies arising in the engineering field in Ontario and across Canada and across the engineering disciplines.

Table 16: Number of Vacancies Available in the Province of Ontario (January 6, 2006)

Engineering Disciplines	**Number of Vacancies**
Mechanical	48
Civil	24
Software	22
Electrical	18
Chemical	9
Process	6
Industrial	4
Computer	4
Textile	1
Mining	1
Aerospace	1
Total Vacancies	**138**

Table17: Distribution of Vacancies by Type of Employers in the Province of Ontario

Engineering Disciplines	**Consulting**	**Construction and Industrial**
Biomedical	0	0
Mining	0	1
Oil & Gas	0	0
Aerospace	1	0
Chemical	2	7
Geological	2	0
Computer	3	0
Industrial	4	0
Mechanical	11	0
Environmental	13	0
Civil	17	1
Electrical	18	0
Total Vacancies	**71**	**9**

Interestingly enough, some of these vacancies remained open even after eight months of being advertised. Assuming this information is representative of the province, it can be concluded that although the professional engineers of Ontario represent over 40% of the total professional engineering fraternity in Canada, the total number of vacancies in Ontario are in the region of 6% of the total of all vacancies available across Canada. However the proportion of vacancies available within Ontario across the disciplines correlates with the general proportions of IEBs in these disciplines. The low number of actual vacancies on a representative job search engine such as Workopolis can be interpreted in terms of one or combination of any of the following:

- Ontario represents a very small market for engineers
- The hidden job market in Ontario is significantly greater than in the other provinces
- Hiring practices adopted by employers in Ontario are of a closed nature so that there is high utilization of recruiters, referrals and low level public advertising.

Table 18: Number of Vacancies Available Across Canada

Areas of Discipline	Number of Vacancies
Marine Engineer	3
Nuclear Engineer	3
Optics\Optical Engineer	3
Drilling Engineer	5
Research Engineer	5
Oil and Gas Engineer	10
Radio Frequency Engineer	12
Automation Engineer	14
Chemical Engineer	14
Tool Engineer	14
Industrial Designer	14
Welding Engineer	14
Engineering Lead	17
ASIC Engineer	18
Instrumentation Engineer	21
Aerospace-Aircraft Engineer	27
Stationary Engineer	29
Mining\Mine Engineer	34
Test Engineer	35
Applications Engineer	38
Materials\Metallurgical Engine	38
Automotive Engineer	39
Product Engineer	46
Controls Engineer	50
Geological Engineer	60
Software Engineer	62
Systems Engineer	72
Electrical Designer	82
Manufacturing Engineer	84
Environmental Engineer	93
Quality Control Engineer	98
Power Generation	109
Structural Engineer	128
Electrical Engineer	157
Design Engineer	167
Process Engineer	193
Civil Engineer	246
Mechanical Engineer	283
Total Vacancies	**2337**

e. Types of Specializations and Experience Required

Using the same approach, an evaluation of the Workopolis engine showed that the types of specializations and experience requirements were as contained in Table 19 below.

Table 19: Vacancies by Specialization and Number of Years of Experience

Areas of Engineering	Areas of Specialization	Experience Required (Years)	Number of Vacancies
Aerospace	Project Management	15	1
Civil	Design-Industrial	3	1
	Design-Airport	5	1
	Design - Remediation	5	1
	Design - Bridge	5 to 15	5
	Design-Structural Analysis	5	3
	Design-Storm water mgt	10	1
	Consulting-Geotechnical	5	1
	Consulting-Hydrogeology	5	3
	Structural -Nuclear	15	1
	Project Management	5	3
	Laboratory	5	1
	Municipal	2	1
	Municipal	5 to 10	2
Chemical	Design -vessels	5	1
	Processing	2-5	4
	Processing	5	3
	Processing	10	1
	Injection Moulding	5	1
	Project Management	5	2
	Design – Microprocessor	5	4
Electrical	Hardware	10	1
	Design Control Systems	5	1
	Design Circuit Cards	5	2
	Design Circuit Cards	10	2
	Instrumentation	5	1
	Project Management	5-10	8
	Production	5	1
	Process -CMOS	10	1
	Tender Preparation	5	1
	Production	5	3
	Project Management	10	1
Mechanical	Design - Automotive	3	1
	Design - Automotive	5	2
	Design - Equipments	5	4
	Design - Equipments	10	2
	Design - Thermal Analysis	5	1
	Design-Mining Sector	5	1
	Design-Machine	5	2
	Design-Piping	5	4
	Material Handling	5	1
	Maintenance	5	1
	Process - Automotive	5	3
	HVAC	5	1
	Process	10	2

Areas of Engineering	Areas of Specialization	Experience Required (Years)	Number of Vacancies
	Production	1	1
	Production	5	5
	Production	10	2
	Project Management	5	7
	Project Management	10	3
	Tooling	5	1
	Tender Preparation	5	1
	Mineral Processing	20	1
Mining	Project Management	5	1
Process	Injection Molding	5	3
	Metallurgy	5	1
	Metallurgy	10	1
	Project Management	5	1
Software	Programming	2	5
	Programming	5	15
	Networking	5	1
	Legacy programming	5	1
Textile	Process	3	1

Majority of the positions listed in Table 19 above call for 5 to 15 years of experience. It can be concluded that there is a good fit in terms of the experience requirements of the employers for these limited vacancies and the length of experience offered by immigrants with engineering backgrounds. There is also a significant match between the kinds of specializations required by the employers and those that IEBs belong to.

However from an analysis of this information, it is clear that very few entry level positions are advertised by the employers.

4. DEMAND AND SUPPLY

a. Background

From 1998 to 2002, Canadian universities introduced 42,000 engineering graduates, BSc, MSc, and PhD into the workforce.[5] In this same period, 62,650 foreign trained engineers immigrated to Canada.[1] The largest number were Electrical and Electronic Engineers and Mechanical Engineer, 27% and 24% respectively, followed by Civil Engineers at 17%. The annual supply of immigrants with engineering backgrounds in 2000 exceeded the domestic supply. Engineering is a regulated profession in Canada so a provincial license is required to practice as an engineer while provincial certification is required to practice as an engineering technician or technologist. CCPE has estimated that about 160,000 licensed engineers practiced in Canada in 2001. The number of immigrants with engineering backgrounds who came to Canada in 2000 alone was close to 8 percent of all

[5] CCPE (2004), Canadian Engineers for Tomorrow, Trends in Engineering Enrolment and Degrees Awarded 1998 to 2002.

practicing engineers according to CCPE. The proportion of foreign-born among those holding an engineering degree in Canada already stood at nearly half (44.5%) in the 1996 census, one of the highest of any occupational category. Given the recent trends of skilled principal applicants, industrial sectors employing large numbers of engineers will likely see their reliance on foreign-trained engineers' increase.[7]

Recent CIC data shows that Ontario accounted for 38.1% of the total population in Canada but roughly 60% of all skilled worker principal applicants were destined for Ontario between1996-2000. The Landed Immigrant Data System indicates that between 1997 and 2001, 64,918 immigrants coming to Ontario identified themselves as members of a regulated profession. Of this total, 39,145 (60 per cent) self-identified as engineers; a further 9,627 identified themselves as engineering technicians and technologists (bringing the total to 48,772, or 75 per cent of all skilled workers immigrating to Ontario). In recent years, PEO has almost doubled the number of licenses granted to internationally trained applicants, more than 60 per cent of whom meet the academic requirements for licensure without writing technical exams.[6] As shown in this section of the report Ontario is an excellent study of the challenge of immigrant access to this profession because of the "critical mass" of immigrants with engineering backgrounds who have come to this Province.

b. Experience and Education Benchmarks

For 50 years, PEO conducted the annual Ontario Engineers' Salaries Survey as a service to engineers and their employers, a responsibility that was handed over to OSPE (the Ontario Society for Professional Engineers) in 2004.[7] 26 benchmarks have been set up by PEO for the purposes of this salary survey and these form the basis for information on wages offered to Ontario engineers. This is contained in Table 20 abstracted from the 2003 salary survey by PEO[8] and the 2004 salary survey by OSPE[7].

This length of experience and education benchmark analysis shows that 60% of the 899 IEBs who had provided data on their dates of graduation with the Bachelors degree fell under C, D, E and F responsibility level associated benchmarks effectively equating them to the professional engineer level of responsibility as opposed to entry level responsibility benchmarks for education and experience defined by PEO in its Ontario Engineers salaries survey of employers.

Table 20: Equating Immigrants Education and Experience to PEO Benchmarks

[6]Fawzia Sheikh, Environmental certification ups the ante for engineers, PEO, *Engineering Dimensions*, November/December 2003, p. 14

[7] Ontario Society of Professional Engineers (2004), Ontario Engineers' Salaries - Survey Of Employers 2004, Summary Report, *http://www.peo.on.ca/publications/publicat7.html*

[8] PEO (2003), Ontario Engineers' Salaries - Survey Of Employers 2003, Summary Report, 50 Years http://www.peo.on.ca/publications/publicat7.html

Level of Responsibility	Entrance Benchmarks	Years of graduation	Number of IEBs
LEVEL A	Bachelor's degree in Engineering, or Applied Science, or its equivalent with little or no practical experience.	2004	0
LEVEL B	Bachelor's degree in Engineering, or Applied Science, or its equivalent, normally with two-to-three years' working experience from the graduation level	2004~2002	352
LEVEL C	Bachelor's degree in Engineering, or Applied Science, or its equivalent, normally with minimum three-to-five years' related working experience after graduation.	2004~2000	51
LEVEL D	Bachelor's degree in Engineering, or Applied Science, or its equivalent, normally with a minimum of five-to-eight years of experience in the field of specialization from the graduation level.	1999~1997	68
LEVEL E	Bachelor's degree in Engineering, or Applied Science, or its equivalent, normally with a minimum of nine- to-12 years of engineering, and/or administrative experience from the graduation level.	1996~1993	101
LEVEL F	Bachelor's degree in Engineering, or Applied Science, or its equivalent, with broad engineering experience, including responsible administrative duties.	1992	248
BEYOND LEVEL F	Bachelor's degree in Engineering, or Applied Science, or its equivalent with many years' authoritative engineering and administrative experience. The incumbent is expected to possess a high degree of originality, skill and proficiency	1992 Those with either PhD or Masters	79

c. Comparison of Responsibilities, Competencies and Other Skills

The benchmarks associated with the level of responsibility of a given individual or engineering job as defined in Table 29 apply to all engineering disciplines. More specific descriptions of skills and competencies associated with the responsibility benchmarks are provided in the *Engineering Salary Survey Benchmarks*[9] and are summarized in Table 21

[9] OSPE (2004), *Engineering Salary Survey-Benchmarks (developed by PEO), http://www.careercentre.ospe.on.ca/uploaddocuments/d144%2BEngineering_Benchmarks_Revised.pdf*

Table 21: Engineering Salary Survey-Benchmarks

Benchmark	Level/Typical Job Title	Competencies	Independence	Leadership	Complexity
1. A	**Entry** *Engineer-in-Training, Technician,*	Simple calculations, analysis, codes and specifications, site and materials testing, computing, communication and presentation, works under supervision but may give assignments to technicians or assistants	Works under direction	Assigns tasks to juniors -technicians and draughtsman	Simple
2. B 2-3 years	**Design** *Product Design, , Design Engineer, Field Engineer.*	Variety of standard engineering techniques/methods, new or revised product design or component of larger projects, data collection and analysis, communication and consultation, CAD.	Work reviewed closely	Checks work for few juniors- technicians and draughtsman	Moderately complex
3. C 3-5 years		Professional Engineer, Designs new products, independent analysis, identification of requirements, defines development of new products, processes or services, consultation, communication and inter-personnel skills, may act as engineering authority for portion of establish product, CAD,	Member of design team, given broad project and technical guidelines.	Team leader, checks work for other junior engineers	Complex but not difficult
4. B 2-3 years	**Sales** *Customer Services Engineer, Engineering Account Executive,*	Definite products, assigned customers , technical assistance, commercial, advice, analysis, communication and listening skills	Duties assigned & reviewed closely	Guides/checks, mentors work for few juniors	Moderately complex design
5. C 3-5 years		Professional Engineer, sells identified products to established customers, investigates products, technical consultant, Analyses and defines customer needs, recommends modifications, advanced communication and inter-personnel skills	Work not closely supervised	May guide several junior engineers	Complex but not difficult
6. D 5-8 years		Professional Engineer, Sells major and new products to established and prospective customers, senior technical consultant, analytical and conceptual skills to identify new applications and markets, Good communication, inter-personnel, presentation and public speaking skills, plans, directs and coordinates work of other sales engineers and staff	Works independently, Supervises a group of diverse professional engineers and technical persons	broad assignments, receiving general instructions objectives, priorities,	Can be difficult and complex
7. D 5-8 years	**Customer Support** *Customer Support Manager, Field Service Group Leader,*	Technical advice, consultation and support to customers, technical support staff, installers, and others, on complex processes and problems associated with products and facilities. Recognized expert within the designated product/service field, Responsible for the implementation and management of complex technical projects such as product appraisal, problem tracking and reporting. Supports new products-installation, implementation, testing. Ensures appropriate customer training,	Provides coaching or training to other junior field service staff. Provides direction and guidelines to other customer support or sales team	Works to general set of instructions, goals and priorities	Can be difficult and complex
8. B 2-3 years	**Computer** *Software engineer, Analyst, Systems Engineer, Systems Analyst, Sr. Hardware Engineer, Project Manager, Manager-Systems Engineering, Principal Engineer-*	Software designs & definition of system, coordination and integration of system, system specifications	Work reviewed regularly	Guides and checks work for few juniors	Moderately complex Systems
9. C 3-5 years		Configures computer systems and networks for users, assessing functional requirements, evaluating equipment and performing acquisition activities for standard products. Carries out project management responsibilities, monitoring progress and costs. Requires listening and communications skills to identify needs, provide consulting advice to users and prepare written reports. Communicate effectively with non-technical system users.	May guide and monitor the work of other more junior engineers or technical staff	Works within clearly defined limits or precedents, seeking advice on unusual problems.	Complex but not difficult
10. D 5-8 years		Engineering specialist leads a team of engineers in the design and development of computing devices for introduction into manufacturing, establishes, guides and monitors a hardware development Process, Plans and initiates the investigation of designs for integrated circuits, silicon chips or other products. Formulates and directs the development of computing devices for manufacture, including product architecture, specifications, technology (component) selection. Directs the application of complex design tools or methods (ex. CAE software). Leads and directs in systems design simulation, tolerance analyses, prototype testing, etc. Strong analytical and problem solving abilities, Effective communication and team leadership skills	Supervises a group of diverse professional engineers and technical persons	Works to general set of instructions, goals and priorities Assigns and monitors the work of other professional engineers and/or technical staff, or - As a recognized technical expert, serves as a consultant	Can be difficult and complex
11. E 9-12 years		Design, programming and commissioning complex computerized information and/or control systems. Development of software and hardware products and system, mature engineering analysis and Design, development of new concepts, philosophy, standards and engineering policy in fields such as instrumentation and control, or control computer applications. Ensures compliance with standards and policies, appropriate training for staff, hiring, transfers, promotions. Strong leadership and people management skills. Project management skills to meet deadlines and coordinate effort.	Directs the work of a group of highly qualified professional engineering specialists	Works under administrative or high level technical direction.	Trouble-shooting and complex

Benchmark	Level	Competencies	Independence	Leadership	Complexity
12. C 3-5 years	**Operations/ Production** Industrial Engineer, Plant Engineer, Process Engineer, Production Manager, Production Engineer,	Professional Engineer, independent studies, analysis and interpretation, process engineering , manufacturing processes, machine tool design, industrial engineering, cost estimates, feasibility studies, definition of scope of work, advanced design and analysis software, consultative, communications and inter-personnel skills	Work not supervised in detail	Guides/checks, mentors work for few juniors engineers and technicians	Complex but not difficult
13. D 5-8 years		Manages tow or more production units of total production process for distinct product or sub-product, directs subordinate supervisors, works with other engineers on technical control, development, design and maintenance, uses new methods, procedures, accountable for quality, quantity, cost. Safety and employee relations. Strong communication, inter-personnel and leadership skills, analytical ability	Works under general direction but maintains continuous contact with next supervision level	Provides general supervision over assigned area and consultation to subordinates	Can be difficult and complex
14. E 9-12 years		Directs the operation of large manufacturing or complex continuous processes (e.g. chemical, mining, etc.), sophisticated engineering control and maintenance systems. Coordinates, specifies and schedules production and maintenance, establishes standards and field tests, Analyzes and corrects off-standard conditions with specialized technical assistance. Plans production in cooperation with other operations and customer demand. Accountable for quality, quantity, cost, safety and employee relations. Strong leadership and people management skills.	Work is reviewed for accomplishment, policy, soundness of approach and general effectiveness.	Directs the activities of all assigned staff, evaluating Performance, establishing developmental plans and approving salary adjustments.	Trouble-shooting and complex
15. C 3-5 years	**Construction Design** *Product Design Engineer, Design Engineer*	Develops the design of complicated components in a specialized field within a branch of engineering (e.g. civil, electrical, mechanical, etc.) for engineering works, structures, installations, processes. Develops plans for the modification or extension of existing facilities. Generally handles more complicated components of larger design projects on which the basic design has been done at a higher level. Prepares reports, cost estimates, specifications. Consultative, interpersonal and communication skills. Advanced expertise in the use of computer application sand CAD or CAE software.	May guide the work of several more junior engineers or technicians employed on the same projects.	Work is not generally supervised in detail.	Complex but not difficult
16. C 3-5 years	**Quality Quality** *Assurance Engineer, Quality Team Leader*	Implements quality assurance programs utilizing quality tools necessary to achieve and maintain objective standards. Utilizes a range of quality tools across a diverse work force.	May serve as a team leader, guiding the work of more junior engineers or technical staff	Works independently, but within clearly defined standards and limits,	Complex but not difficult
17. D 5-8 years	**Environment** *Environmental Engineer, Project Manager,*	Leads complex investigations to identify and diagnose health and environmental problems and develop remedial action plans, applies mature engineering knowledge. Detailed analysis of environmental issues and development of recommended remedial policies, Plans and implements environmental control programs, knowledge of environmental legislation, knowledge of and facility with computer applications, computer modeling, strong communication, public consultation and reporting skills.	May lead a team of specialists	Works independently on broad assignments Works within general instructions in terms of objectives and priorities.	Can be difficult and complex
18. D 5-8 years	**Supervisory** *Engineering Manager, Project Manager, Director-Engineering, Principal Engineer*	Works in single discipline, single product design, plans and designs new structures/products, extensions and modifications, delegates and oversees subordinates, meets deadlines, prepares documentation, specifications and drawings, cost estimates, engineering studies , project management, communication, coordination and leadership skills	Supervises a group of diverse professional engineers and technical persons	Works to general set of instructions, goals and priorities	Can be difficult and complex
19. E 9-12 years		Supervises an engineering department of professional and/or non-professional technical people performing a variety of complex, technical applications, planning and coordinating assigned projects. Short and long range planning pertaining to budget requirements, staff selection and projects to be undertaken. Technical direction to management. Responsible for investigations and reports such as cost estimates, technical studies, unusual trouble analysis, etc	Directs the work of highly qualified professional engineering specialists,	Works under administrative or high level technical direction.	Trouble-shooting and complex
20. F More than 13 years		Responsibility for planning associated activities, limited only by company policy. Establishes objectives and basic operating policies. Devises ways of reaching program objectives in the most economical and effective manner. High level leadership abilities to conceive program goals and directions, plan work efforts, establish an effective team and motivate subordinate managers	Acts as engineering consultant and adviser to the organization	Works independently on broad general assignments	Total responsibility

Benchmark	Level	Competencies	Independence	Leadership	Complexity
21. D 5-8 years	**Project** *Project Manager, Project Engineer, Principal Engineer, Project Manager, Project Director,*	Executes, coordinates and expedites a succession of different engineering jobs, as part of capital expenditure projects, feasibility studies, engineering surveys, site investigations, cost benefit analysis, final design and specifications, project management, superior communication, interpersonal and negotiating ability,	Coordinates the work of, and gives technical guidance to other engineers and technicians assigned to a given project.	Works within broad guidelines requiring conformity with overall plans, dates and budgets	Can be difficult and complex
22. E 9-12 years		Plans, assigns and coordinates the work of several project engineers and technicians engaged as a team in different portions or phases of an engineering project of moderate proportions, or a portion or phase of a project of major proportions. Short and long range planning. Makes independent decisions on work methods and procedures, successfully completes the assignment on time and within budget, assuming full responsibility for its technical excellence. Reports progress. Directs use of equipment and material. Represents employer's interests in dealings with senior representatives of customers, clients, contractors and suppliers. Good business planning and project management skills, strong leadership and people management skills.	Assigns work to staff, outlining problems and advising on difficult problems and methods of approach.	Works under administrative or high level technical direction. motivate staff, set priorities	Trouble-shooting and complex
23. F More than 13 years		Works independently, plans, direct and coordinate major projects involving large capital expenditure for new construction or conversion of existing processes, systems or structures. Schedules and organizes all phases of a major project, reviews engineering and design schedules, staffing budgets and controls. Monitors budget and progress. Strong communication and presentation skills to represent the employer to senior customer or client representatives. Strong leadership ability to motivate staff and coordinate effort.	Provides technical and administrative direction to Subordinate staff and senior professionals.	Exercises broad management authority	Total responsibility
24. D 5-8 years	**Research and Development** *Sr. Research Engineer, R&D Engineer, Project Manager, Director-Research & Development, Director-Engineering,*	Engineer-specialist in a particular field of engineering development or research, Applies mature engineering knowledge in planning and Implementing projects, investigates complex problems, and/or develops new and basic concepts. Formulates and directs control experiments, or prototype or model studies. Coordinates difficult and responsible assignments. Sound project management, communication and work coordination skills, Recognized technical specialist, serves as a consultant to others,	Guides the work of other professional engineers	Assigns and monitors the work of other professional engineers and/or technical / engineering staff,	Can be difficult and complex
25. E 9-12 years		Works as a senior engineer-specialist or consultant in a particular field of engineering, development, or research. Participates in planning, organizes work methods and procedures. Original ingenious approaches to the practical and economical solution of problems. Directs research into new resources, products, processes, or methods. Interprets and evaluates data obtained from research investigations. Participates in management meetings related to the function and in cross-functional meetings. Keeps well informed of the latest technological developments in the chosen field. Develops and sustains a reputation for efficient planning and a high level of analytical and creative thinking.	Works under administrative and/or high level technical direction.	Technical authority over a small team of engineer-specialists.	Trouble-shooting and complex
26. F More than 13 years		Acts as a recognized consultative authority in an important field of engineering, development, or research, formulating broad approaches to the solution of large scale problems. Plans, organizes and develops design and/or applied research activities, giving advisory direction to a small group of highly qualified engineer-specialists.	Gives consultative direction to a group of highly Qualified specialists.	Receives broad administrative direction.	Total responsibility

A comparison of the skills and competencies acquired by immigrants with engineering backgrounds presented in Table 9 and the PEO benchmarks set out in Table 20 is presented in Table 22

Table 22: Technical competencies and soft skills

Type of Technical Skills	Typical Technical skills	Equivalent PEO Salary Benchmark	% of Occurrences
Research and Development	Knowledge management, academic Research, applied research, proposal development, Inquiring, innovative, creative, academic, report writing, originality	Research and Development, D, E, F	0.6%
Planning	Proposal development, Client management, information management, Resource management, forecasting and operations research, Preparing activity, resource and tome schedules, Technical, economic etc analysis, appraisal, evaluation, information and recording, progress monitoring.	Project E. F	11.5%
Project Management	Claims and arbitration, Construction supervision, Contract documentation, Coordination of contractors and consultants, teamwork, communication,	Project D	6.3%
Feasibility Studies	Academic/Research, Site investigations, data logging, conceptualizing, codes and regulations, Design calculations, technical reports, appraisal/evaluation, Analysis, appraisal, evaluation, conceptualizing, visual and written communications, presentations, information collection and analysis	Project D, E	1.4%
Process Development	Site specific investigations, conceptualizing, codes and regulations, design calculations, technical reports, analysis, appraisal, evaluation, conceptualizing, visual and written communications, presentations, information collection	Operations/ Production D, E	0.4%
Design	Site investigations, data logging, conceptualizing, codes and regulations, Design calculations, Design Drawings, technical specifications, design reports Contract documentation and law, tendering, site supervision, analytical, independence, team building, teamwork, client liaison, creativity, mathematical, innovative, meticulous, visual communications, report writing, computing.	Design B, C	19.1%
Process Design	Conceptualizing, codes and regulations, design calculations, design Drawings, technical specifications, design reports Contract documentation and law, tendering, supervision, operation Contract documentation, analytical, independence, team building, teamwork, client liaison, creativity, mathematical, innovative, meticulous, visual communications, report writing, computing. System Design	Operations/ Production, F	0.7%
Instrumentation and Controls	Information management, Instrumentation, circuitry, digitization, Interference analysis,, workplace safety, Systems analysis, operations research, troubleshooting, communications, technical reporting and documentation	Computer E	2.1%
Costing	Information management, quantity surveying, project management, Tendering/bidding, Estimating, information collection and processing, numerate, computing and software	Construction Design C	1.7%
Estimating	Take out quantities from the drawings to prepare BOQ, Claims and arbitration, Analytical, computing, meticulous, information management	Construction Design C	2.9%
Tender Document Preparation	Contract documentation, Bidding, Bid evaluation,, site meetings, Preparing RFP, RFQ, special conditions of contract and material specifications	Construction Design C	10.7%
Construction	Construction management and supervision, Plant management, materials procurement and control, activity scheduling and programming, cost and manpower management, Leadership, supervision, record-keeping, troubleshooting, administration, teamwork, communication. initiative, record keeping, progress monitoring and reporting	Supervisory D, E	9.4%
Execution	Client needs assessment, identification of project partners, quality control, scheduling and time management, budgetary control, Materials specification, Claims and arbitration, Supervision, teamwork, leadership, monitoring, meetings and communications, troubleshooting, scheduling, organizational, meeting deadlines, resource management	Project E, F	4.3%
Implementation	Claims and arbitration, manpower, materials and plant management, extrusion, Plant Installation, Supervision, teamwork, meetings and communications, troubleshooting, scheduling, meeting deadlines, resource management, progress monitoring and reporting	Supervisory D	5.4%
Production	Process control, Manpower management, Plant and assembly line control, Plant Installation, Product Design Analysis Supervision, teamwork, meetings and communications, troubleshooting, scheduling, organization, meeting target, resource management, materials control and management, Systems control	Operations/ Production, F	4.4%
Project Control	Claims and arbitration, Time, cost and quality control, Manpower and activity Scheduling, quality assurance	Project E	0.6%
Procurement	Materials identification, purchasing, plant acquisition and hiring, manpower planning and recruitment, people skills, information and data collection and analysis, quotations, services contracting, interpersonal skills, sales and marketing	Customer Support D	3.2%
Commissioning	Plant Installation, operations, maintenance, preparation of manuals, training leadership, teamwork, communication, documentation, troubleshooting, independent	Operations/Production D	4.7%
Maintenance	Process control, training, manpower control, Root cause analysis, troubleshooting, Leadership, supervision, teamwork, management	Operations/Production D	10.7%
Quality Control	Product Analysis, quality assurance, systems control, investigative, recording and communications, interpersonal skills	Quality C	83%

Based on this comparison 80% of the competencies of the more than 300 immigrants who submitted their resumes fit in with the skills acquired by those benchmarked as professional engineers as compared to 60% if the basis is experience and education.

d. Comparison of Employment Rates

As shown in Table 23 the unemployment rate among the surveyed IEBs is 56.36%. The employment rate in engineering is 15.21%. The remainder are employed in non-engineering jobs usually in an under-employed position. This compares with the employment profile for the six major disciplines of engineering in Ontario shown in Table 24 below as abstracted from the Job Futures Ontario website[10]

Table 23: Unemployment Rates for Different Engineering Disciplines In Ontario

Engineering Discipline	National Occupational Classification code	Average Unemployment Rate %
Civil Engineers	2131	3
Engineering, Science & Architecture Managers	0210	3
Electrical and Electronics Engineers	2133	3
Mechanical Engineers	2132	3
Computer Engineers	2147	2
Civil, Mechanical, Electrical and Chemical Engineers	213	3
Other Engineers	214	3

From these statistics it can be concluded that there is a small surplus of engineers as indicated by the fact that this profession does not enjoy full employment in Ontario. Presumably the 2% to 3% unemployed persons in these statistics also include foreign trained engineers. It can be concluded from the high unemployment among the immigrants with engineering backgrounds that they make up the major part of the unemployed engineers in Ontario. Thus, the employment gap is very substantial for IEBs.

e. Comparison of salaries

The Engineers salary survey for 2004 carried out by OSPE[7] provides data on the salaries earned by engineers associated with the various levels of responsibility benchmarks. This data is summarized in Table 24. As can be seen from this Table the minimum median salary of IEBs based on the minimum education and experience benchmarks should be $56,700 while over 50% should be earning over $83,471. In reality as seen from Table 11 and chart 4 56.21% of them are unemployed, and of those who are employed, 50% earn less than $35000 per year. The income gap for immigrants with engineering backgrounds is also substantial.

[10] **Job Futures Ontario** http://jobfutures.ca/noc/0210.shtml

Table 24: Equating Immigrants Education and Experience to PEO Benchmarks

Level of Responsibility	Entrance Benchmarks	Median Salary [9]	Years of graduation	Cumulative percentage of IEBs
LEVEL A	Bachelor's degree in Engineering, or Applied Science, or its equivalent with little or no practical experience.	**$48,404**	2004	0%
LEVEL B	Bachelor's degree in Engineering, or Applied Science, or its equivalent, normally with two-to-three years' working experience from the graduation level	**$56,700**	2004~2002	39.15%
LEVEL C	Bachelor's degree in Engineering, or Applied Science, or its equivalent, normally with minimum three-to-five years' related working experience after graduation.	**$67,449**	2004~2000	44.83%
LEVEL D	Bachelor's degree in Engineering, or Applied Science, or its equivalent, normally with a minimum of five-to-eight years of experience in the field of specialization from the graduation level.	**$83,471**	1999~1997	52.39%
LEVEL E	Bachelor's degree in Engineering, or Applied Science, or its equivalent, normally with a minimum of nine- to-12 years of engineering, and/or administrative experience from the graduation level.	**$95,004**	1996~1993	62.63%
LEVEL F	Bachelor's degree in Engineering, or Applied Science, or its equivalent, with broad engineering experience, including responsible administrative duties.	**$109,200**	1992	91.21%
BEYOND LEVEL F	Bachelor's degree in Engineering, or Applied Science, or its equivalent with many years' authoritative engineering and administrative experience. The incumbent is expected to possess a high degree of originality, skill and proficiency	**Not Reported**	1992 Those with either PhD or Masters	100%

5. LICENSING AND COMMUNITY SUPPORTS

a. Overview

In 1974, the Department of Manpower and Immigration expanded its settlement mandate from the mere reception of immigrants to employment, accommodation, and settlement assistance. It also took over responsibility for the overall coordination of voluntary organizations providing immigrant adjustment and settlement assistance. This led to the establishment of the Immigrant Settlement and Adaptation Program (ISAP), which was

started to fund initial settlement services, such as information provision, orientation, and referral to mainstream service agencies[11].

The Settlement Language Training Program (SLTP) created in1986 was designed to meet the needs of adult immigrants, primarily women and seniors, who were not destined for the labour force. Immigrant organizations received substantial funding to enter the field, with school districts and colleges serving as the actual language-training providers. Many agencies formed alliances with already existing providers in the development of new and innovative programming, particularly in the Toronto region, where a number of agencies partnered with local school boards. Over time, deficiencies also became apparent in the SLTP. In 1992, two new immigrant-training programs for adults were initiated by the federal government: Labour Market Language Training (LMLT) and Language Instruction to Newcomers to Canada (LINC). LINC has become the dominant adult second-language-training structure in Canada. It has gradually replaced almost all other English training programs in the country, and has been instrumental in the development of a myriad of national assessment and curriculum projects.[11]

The increased importance of immigration in Canada's strategy to grow its labour force and address skills shortages placed additional pressures on institutions to recognize credentials acquired in other jurisdictions. Between 1991 and 1995, through the Federal Immigrant Integration Strategy, a new emphasis began to be placed both on helping immigrants learn about Canadian values and on helping Canadians understand the diverse backgrounds of newcomers.[11]

In 1991, the government of Quebec took on responsibility for settlement services in that province, and began receiving funding from CIC under the Canada-Quebec Accord. By 1995, the federal government had launched the Settlement Renewal Process to devolve the administration of settlement services to the rest of the provinces. In 1998, agreements were signed with the provinces of British Columbia and Manitoba to transfer funds for the administration of settlement services. In 2005, Ontario joined this trend by signing the Canada-Ontario settlement accord.[11]

For immigrants with engineering backgrounds these have led to the development of licensing, language and community supports and outcomes reported in this section.

b. Licensing Support

Pre Immigration - Engineering International-Education Assessment Program (EIEAP)

The Canadian Council of Professional Engineers (CCPE) runs the Engineering International-Education Assessment Program (EIEAP) to assess the educational qualifications of individuals who were educated and trained outside of Canada, by comparing their education to a Canadian engineering education. The EIEAP is the only assessment service in Canada specializing *exclusively in the assessment of engineering*

[11] Bambrah, Gurmeet. (2005). Canadian 'Experiments' in Diversity: The Case of Immigrants with Engineering Backgrounds Who Settle in Ontario. CERIS Working Paper Series, No. 41. November 2005. pp 16-19

education credentials. It does not evaluate work experience. This assessment was part of the formal immigration process until March 2003 when it became as informal option.

According to CCPE the EIEAP assessment provides applicants with valuable information on how their foreign education compares to a Canadian engineering education. This is important as the definition of engineering varies from one country to the next. Work and training that is called Engineering with the job title Engineer in some countries may fall into a different job category in Canada. The EIEAP assessment allows applicants to make an informed choice about immigrating to Canada as *skilled workers* or in the *family class*. Immigrants with engineering backgrounds who had obtained the EIEAP before applying to come to Canada were surveyed to assess the outcomes of this support. The following were the outcomes reported by 68 respondents.

Table 25: Outcome of EIEAP Reported by IEBs

Outcome	**No of Respondents**	**% of Respondents**
Number of participants who underwent CCPE evaluation	68	100%
Number of respondents who received a positive outcome	59	87%
Number whose CCPE evaluation was recognized by PEO	0	0%
Number whose CCPE evaluation was recognized by employers or industry	1	2%
Number who had to get another evaluation done after arrival in Canada	50	73%

Provincial Licensing Guide

Professional Engineers Ontario (PEO), the provincial regulator makes available the Licensing Guide and Application for Licence on *How to apply for a Professional Engineer Licence in Ontario.* By making this available online, PEO has made it possible for the immigrant to initiate the licensing process well before arrival. However, no information is made available to the potential immigrant about the difficulties of fulfilling the experience requirements for the license. On arrival in Ontario PEO counsellors also make presentations at various newcomer forums about how to apply for the license. Again these counsellors provide no technical or labour market support to the immigrants with engineering backgrounds.

Licensing and Regulation Facts

Information for internationally trained professionals and skilled workers is available at the Access to Professions and Trades Initiative through their opening doors to internationally trained individuals portal through the Ministry of Training Colleges and Universities website link; www.citizenship.gov.on.ca/english/citdiv/apt/. Established in 1995, the Access to Professions and Trades (APT) is undertaking initiatives to reduce/remove barriers to licensure and certification in the professions and trades. The following five barrier areas operating as key deterrents for internationally trained

professionals and tradespersons in gaining access to licensure/certification in their profession or trade have been identified by APT:

- Assessment of academic credentials and skills
- Licensure and certification testing
- Lack of appropriate language testing and training
- Supplementary education and training
- Review and appeal of licensure and certification decisions

Two supplementary training programs are being run by APT that target immigrants with engineering backgrounds:

- The Options: *Choosing the Optimal Route to Success* project developed in partnership with the Center for Language Training and Assessment (CLTA) and the Ontario Association of Certified Engineering Technicians and Technologists (OACETT). Under this candidates are provided with the language and employment readiness skills, contacts, and networking opportunities that they require to become independent job seekers. The sector-specific language, certifying exam and employment preparation tools will be a permanent resource for future program use
- The Preparation for Apprenticeship**,** *Trades & Technology (PATT) (Construction and Manufacturing Trades).* This is a comprehensive project in the skilled manufacturing trades (machinist, tool and die maker, industrial maintenance mechanic, welder) to increase the pool of skilled workers in Ontario. The modular program will provide internationally trained workers with opportunities to prepare for certification and to gain the competencies necessary for finding an apprenticeship or work in these trades

143 immigrants with engineering backgrounds responded to a survey carried out to evaluate the interest of this fraternity in the APT programs listed above. The following were findings of this survey:

- 64.3% of the respondents would participate in a bridging program to meet the one year Canadian experience under a licensed engineer or for certification as a technician or technologist provided the regulators accept this bridging as a substitute for the required experience.
- Only 33.5% of the respondents were comfortable with the apprenticeship route

c. Accreditation Supports

The credential assessment supports available to immigrants are confusing as indicated by the inquiries received by CAPE (an average of 1-2 per working day) regarding this process. The immigrants are not fully sensitized to the Canadian 'obsession' with credential recognition as many parts of the world do not enforce this process with the rigidity adopted in Ontario and Canada. The Onus is upon the immigrant with engineering background to find out about the accreditation process and supports.

When faced with the need to justify their credentials to pursue higher education, employment or licensing immigrants with engineering backgrounds are baffled as to which accreditation agency to approach.

For an academic credential assessment for the purposes of becoming licensed or certified in a profession or trade, the regulator must be approached to find out what accreditation service to use. Many regulators do their own credential assessments, or only accept assessments from certain services. Many immigrants with engineering backgrounds are not even aware that they are required to provide university transcripts for their degrees with the licensing application so they try to get their credentials assessed by other agencies only to find that PEO or OACETT (Ontario Association of Certified Engineering Technologists and Technicians) does not recognize any other accrediting agency.

The Ontario government has funded World Education Services – Canada (WES), who provide credential assessments for employment purposes but this agency does not have a searchable database that immigrants can use to find out if the employer they are considering will recognize WES and many employers have never heard of this accreditation service

Educational institutions add to all this confusion by often using their own internal credential assessment processes and they too may not recognize assessments done from other sources such as CPPE, PEO or WES.

Finally it is noteworthy that all the accreditation bodies charge between a hundred and two hundred and fifty dollars for each credential assessment.

Prior Learning Assessment and Recognition (PLAR)

Another little understood support for immigrants with engineering backgrounds is Prior Learning Assessment and Recognition (PLAR) that many Ontario colleges of applied arts and technology use to decide what credit should be given for students' previous education and experience.

Prior Learning Assessment and Recognition (PLAR) works towards assessing how much someone knows and can do.

d. English as a Second Language (ESL) & French as a Second Language (FSL) Resources and Information

Pre-Immigration Supports

Since February 2003, all principal skilled worker immigration applicants are required to provide proof of language skills and to take a language proficiency test given by an organization approved by Citizenship and Immigration Canada (CIC). The approved organizations include:

IELTS: International English Language Testing System

The University of Cambridge Local Examination Syndicate, IDP Education Australia: IELTS Australia and the British Council administer this test. IELTS has two options for the reading and writing tests; the 'General Training' and an 'Academic' option. The applicant must take the "General Training" option

TEF: Test d'Evaluation de Français

The Paris Chamber of Commerce and Industry administers these tests. The applicants must submit results from the TEF tests as proof of their French language skills:

Immigrants are provided with the following information on equating the results of these tests to the Canadian Language Benchmarks.

Table 26: International English Language Testing System (IELTS): Test Score Equivalency Chart

Level	**Points (per ability)**	**Test Results for each Ability**			
		Speaking	**Listening**	**Reading** (General Training)	**Writing** (General Training)
High (CLB/SLC 8-12)	First Official Language: **4**	7.0 - 9.0	7.0 - 9.0	7.0 - 9.0	7.0 - 9.0
	Second Official Language: **2**				
Moderate (CLB/SLC 6-7)	**2**	5.0 - 6.9	5.0 - 6.9	5.0 - 6.9	5.0 - 6.9
Basic (CLB/SLC 4-5)	**1** (to a maximum of 2)	4.0 - 4.9	4.0 - 4.9	4.0 - 4.9	4.0 - 4.9
No (CLB/SLC 0-3)	**0**	Less than 4.0	Less than 4.0	Less than 4.0	Less than 4.0

Table 27: Test d'Evaluation de Français (TEF): Test Score Equivalency Chart

Level	Points (per ability)	Test Results for each Ability			
		Speaking (expression orale)	**Listening** (comprehension orale)	**Reading** (comprehension ecrite)	**Writing** (expression ecrite)
High (CLB/SLC 8-12)	First Official Language: **4**	Level 5 Level 6 (349-450 points)	Level 5 Level 6 (280-360 points)	Level 5 Level 6 (233-300 points)	Level 5 Level 6 (349-450 points)
	Second Official Language: 2				
Moderate (CLB/SLC 6-7)	**2**	Level 4 (271-348 points)	Level 4 (217-279 points)	Level 4 (181-232 points)	Level 4 (271-348 points)
Basic (CLB/SLC 4-5)	**1** (to a maximum of 2)	Level 3 (181-270 points)	Level 3 (145-216 points)	Level 3 (121-180 points)	Level 3 (181-270 points)

Language Instruction to Newcomers to Canada (LINC)

The Government of Canada, in cooperation with local school boards, community colleges, immigrant and community organizations, offers language training across the country. The name of the program is LINC, which stands for Language Instruction for Newcomers to Canada. There are 16[12] LINC assessment centers across Ontario. Under this program language training needs of immigrants are assessed and they can be referred to LINC classes from benchmark levels 1 to 5 which are too low for the language demands of employers in the engineering field. In Ontario many universities and community colleges also offer language classes, as do some private language schools and community organizations.

e. Community Employment Supports

Community organizations began to provide a wide range of employment supports to help immigrants adapt to life in Ontario as emphasis began to be placed both on helping immigrants learn about Canadian values and on helping Canadians understand the diverse backgrounds of newcomers in early 1990s. These included

HRDC Funded Employment Centers

The Department of Human Resources and Skills Development (HRSD) is responsible for providing all Canadians with the tools they need to thrive and prosper in the workplace and community. It provides an information clearing house for questions about international credentials, recognition and standards as well as fact Sheets, guides, contact information, labour market information and bulletins among other resources for

[12] http://www.eslincanada.com/linc_programs.html

jobseekers. It also funds a number of community supports available to immigrants with engineering backgrounds.

Information Supports

Typical examples of employment information support include:

- The possibilities[13] project built by Community Information Toronto and Human Resources Development Canada to provide Toronto residents with online access to employment, education and training information.
- Work Destinations[14] which is a comprehensive source of information on regulated trades and professions in Canada. It contains information on entry requirements in both official languages and is the only site designed primarily for professional or trades people moving within Canada. It also provides information for persons considering immigration to Canada.

Ontario Council of Agencies Serving Immigrants (OCASI)

OCASI was formed in 1978 and its membership is comprised of more than 170 community-based organizations in the province of Ontario. It acts as a collective voice for immigrant-serving agencies and coordinates response to shared needs and concerns. OCASI member agencies provide employment supports including

- Employment support including sector terminology, licensing information, labor market research, resume writing, networking and cold calling, and interview techniques; and
- Job and skills training including voluntary or paid work placement search and mentoring.

The following examples typify the employment supports availed to immigrants with engineering backgrounds provided by this community.

Sector Terminology, Information and Counseling (STIC)

The project was developed for four sectors: Engineering, Accounting, Health Care, and Automotive Service Mechanics. According to information made available on the Settlement.org website[15] STIC workshops were designed to be used in a classroom setting and assist individuals to learn more about their occupation in a Canadian context, including licensing/certification requirements and labour market conditions. They also learned the terminology of their occupation as it was used at work or in job advertisements,

[13] Welcome to Possibilities, http://www.possibilitiesproject.com/index.asp
[14] Welcome to the Work Destinations Website, http://www.workdestinations.org/home.jsp?lang=en
[15] http://atwork.settlement.org/STIC/English/EG/home.asp

In 1993 Skills for Change was one of the first agencies to provide information sessions and training for immigrants with engineering backgrounds. By 1998 these informational workshops evolved into the Sector Terminology, Information and Counseling (STIC) program. It delivered group training modules that helped internationally-trained professionals in the licensing process and/or to find employment in their field. The whole STIC menu for immigrants with engineering backgrounds included, sector terminology, licensing information, labor market research, resume writing, networking and cold calling, interview techniques, voluntary or paid work placement search and mentoring.

Employment Programs for Newcomers & Internationally Trained Individuals (COSTI)[16]

COSTI has extensive expertise and experience in operating employment programs aimed specifically at assisting internationally trained individuals to obtain meaningful employment. COSTI's employment programs support IEBs in seeking employment through their Job Connect and mentorship partnerships. These include Information on language, credentials assessment and licensing, job search seminars, career counseling, return to work action planning, job trials, job shadowing and volunteer opportunities, subsidized on-the-job training or direct job placement and continued support to ensure successful integration into the Canadian workforce.

The New Canadian Program[17]

This assists foreign-trained professionals and trades people who are eager to enter the Canadian job market in employment settings related to their education and experience while assisting Canadian businesses find the skills they need. The supports availed to the newcomers include:

- Becoming oriented to Canadian work culture.
- Understanding professional accreditation requirements.
- Canadian work experience.
- Learning technical/business English.
- Building networks.
- Employment.
- Discovering newfound confidence, a positive outlook, and a sense of teamwork.
- Having the opportunity to enrich Canada's labour pool and increase its competitiveness in the global economy

A survey questionnaire aimed at investigating the outcomes of the typical employment supports for immigrants with engineering backgrounds was sent to just under 1000 immigrants with engineering backgrounds. 184 responses were received and the analysis of these responses show is presented in Table 28.

[16] COSTI (2006), Programs and Services, http://www.costi.org/programs/program_services.php
[17] NCP (2006) About the Program http://www.newcanadians.org

Table 28: Outcome Assessment – Community Employment Supports

Employment tool	Number of users	Percentage
1. Number of IEBs who attended an employment preparation program?	144	78.26%
2 Duration of employment preparation program		
• Less then one week	33	22.92%
• One-Three Week	27	18.75%
• Four-Six weeks	54	37.50%
• More	29	20.14%
3. Program assessed to be:		
• Excellent	16	11.11%
• Good	56	38.89%
• Fair	51	35.42%
• Poor	20	13.89%
4. Engineering resume writing assistance assessed to be:		
• Excellent	12	8.33%
• Good	61	42.36%
• Fair	45	31.25%
• Poor	26	18.06%
5. Licensing information support rated as:		
• Excellent	18	12.50%
• Good	54	37.50%
• Fair	34	23.61%
• Poor	33	22.92%
6. Networking and cold calling support rated:		
• Excellent	14	9.72%
• Good	48	33.33%
• Fair	57	39.58%
• Poor	24	16.67%
7. Work Placement rated to be:		
• Excellent	8	5.56%
• Good	22	15.28%
• Fair	23	15.97%
• Poor	81	56.25%
8. Mentoring Program ranked to be		
• Excellent	9	6.25%
• Good	23	15.97%
• Fair	28	19.44%
• Poor	69	47.92%
9. Number who Found employment upon completion:		
• Yes	17	11.81%
• No	124	86.11%

As can be seen from this survey less than 12% of the IEBs who attended these programs were able to access gainful employment. This compares with 15.21% employed in engineering jobs in the sample of 1003 IEBs who participated in the main survey.

APPENDIX 1: EMPLOYER QUESTIONNAIRE AND RESPONSES

Question	Response		Comment
	Yes	No	
1. Would you consider hiring an ITEG?	9	0	
2. Would you consider hiring an ITEG with a P.Eng?	9	0	
3. Would you consider hiring an ITEG without a P.Eng?	9	0	
4. Does your company provide professional development courses?	6	3	
5. Does your company provide ESL courses?	0	9	
6. Does your company provide technical training courses?	7	2	
7. Do Human Resources drive the hiring process?	3	6	
8. Do project managers drive the hiring process?	7	2	
9. Do you post jobs on your corporate website?	7	2	
10. Do you advertise in trade magazines?	3	6	
11. Do you advertise in newspapers?	5	4	
12. Do you advertise on job boards?	7	2	
13. Does your company have an employee referral policy?	6	2	I did not answer
14. Do you use recruitment agencies?	7	2	
15. Does your company work in Canada?	8	0	1 did not answer
16. Does your company work in North America?	6	1	2 did not answer
17. Does your company work internationally?	6	3	
18. Does your company hire international engineers from the countries where you do business?	7	2	
19. During the interviewing process do you emphasize:			
• Membership of Associations (PEO)?	3	6	
• Postgraduate education?	5	4	
• University education?	7	2	
• College education?	6	2	1 did not answer
• Technical training?	7	2	
• Specific Project experience?	9	0	
• Specific hard skills (software programs)?			
i. Written?	9	0	
ii. Presentation skills?	8	1	2 did not answer
iii. Designation	6	1	
20. Have you taken ESL?	6		
If yes how old were you when you took ESL?			
• In School?	3		
• In College?	2		
• Adult?	1		
21. If English is your second language do you feel the challenge of language skills has held you back in your career advancement?	1	4	4 did not answer

22. How do you rank your communication skills: • Excellent? • Good? • Fair?	 6 2		 1 did not answer
23. How do you rank your written reports : • Excellent? • Good? • Fair?	 6 1 1		 1 did not answer
24. How do you rank your design reports: • Excellent? • Good? • Fair?	 5 2 1		 1 did not answer
25. How do you rank your presentation skills: • Excellent? • Good? • Fair?	 4 3 1		 1 did not answer
26. Do you think English writing courses for ITEGs with an emphasis on engineering would be helpful?	9	0	
27. Do you think communication courses for ITEGs with an emphasis on engineering would be helpful?	9	0	
28. Do you think that an accent reduction course for ITEGs with an emphasis on engineering would be helpful?	3	6	
29. Do you think courses for ITEGs on policies and guidelines in Ontario would be helpful?	6	3	
30. Do you think courses for ITEGs on policies and guidelines at the Federal level would be helpful?	6	3	
31. Do you think courses for ITEGs on policies and guidelines at the municipal level would be helpful?	4	5	
32. If the United Kingdom selection process met your professional standards would you be willing to expand your hiring criteria?	4		5 did not answer
33. Do you think utilizing the United Kingdom's selection process may be reasonable for the PEO?	4		5 did not answer.