

**Electricity Sector Council Labour Market Transition Supply:
Summary Report**



Final Report

**Prepared by the Educational Policy Institute
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Executive Summary¹

The Electricity, Environment, Mining, Petroleum, and Trucking Sector Councils commissioned a series of reports to investigate a mutual challenge: the growing shortage of workers capable of filling in-demand, high-skill positions. This report brings together the findings from these reports into one document, and looks at the results as they pertain to the electricity industry in particular. It focuses on two basic issues: (1) *who* can fill the in-demand occupations in the industry, and (2) *how* can they best make the transition.

Available Workforce & Skills Transferability

The first section of the report deals with the “who” question. To find out which workers are most likely able to step into the in-demand or “key” occupations in the electricity sector, a multi-step process was used. The Electricity Sector Council identified 15 key occupations. A “Similarity Index” was created in order to measure the degree of similarity between these jobs and occupations in other fields (based on educational background). A filtering process produced a list of over 100 occupations which are sufficiently similar to be of interest to the electricity sector. These are the “target occupations.”

The next step was to figure out which industries contain large numbers of workers in target occupations. In order to be of interest as a potential source of labour, the industry also needs to be in decline – the pressure of falling employment levels means that substantial numbers of these workers will be looking for new jobs in a different industry. National and provincial data were used to create a shortlist of “target industries” which are in decline and have a large pool of workers in one or more target occupations. The shortlist comprises:

- Chemical Manufacturing;
- Integrated Forestry Companies (Logging, Wood Products, Paper Products); and
- Transportation Equipment Manufacturing.

Finally, a “Skills Transferability Matrix,” specially developed for this project, was used to compare each key occupation with similar occupations in the target industries. For each pairing of key occupation and target occupation, the Matrix shows the degree of similarity with respect to:

- educational background;
- skills;
- knowledge; and
- income level.

The Skills Transferability Matrix is a valuable tool for further research and analysis. It suggests specific occupations which may be a good match for the electricity sector’s key

¹ This report is a summary of work done by the Centre for Spatial Economics for Human Resources and Skills Development Canada and five sector councils.

occupations and allows comparisons to be made on several key points. Both the Matrix and an explanation of how to read it can be found in Section 1.4 of the report.



Transition Measures

The second part of the report deals with the question of how workers in target occupations can be prepared to take over key occupations in the electricity sector. Evaluations of labour market transition measures in Canada, the U.S., and other OECD countries were surveyed in order to determine which policies are most effective in moving workers from one industry to another, especially in mass layoff situations.

The available evidence is somewhat limited, as it focuses mainly on government-led initiatives rather than those developed by companies, but some tentative conclusions can be drawn. Most active labour market transition policies (i.e., those aimed at directly improving the re-employability of individuals) are either not effective or not cost effective (and often both). The existing data do not support the use of wage subsidies, long-term retraining schemes, public works programs, and micro-enterprise training schemes.

There are some schemes which have had positive results, however, most notably:

- *Job search assistance.* This seems to be the most effective in terms of helping put workers in new jobs with no loss of wages. It is also the most cost effective.
- *Training schemes.* Retraining workers for new jobs tends to be costly and inefficient, but on-the-job training, short-term training, and skills upgrade training – especially if carefully developed to provide in-demand skills – can be a beneficial transition measure.
- *Rapid response worker adjustments.* Impressive results have occurred in North America when skilled specialists have organized rapid response worker adjustments using Re-employment Assistance Committees or Labour Management Adjustment Teams.

An important element in any successful transition policy would appear to be timing. Put simply, the earlier the intervention, the more effective it is. Ideally, the electricity sector should try to be involved in transition efforts *before* workers are laid off. For example, by intervening in areas where mass layoffs are anticipated, the sector can help set up job search services and provide information to workers facing impending job loss, and reach the most highly skilled and easily re-employable workers before they jump ship.

Next Steps

The most cost-effective way to enhance labour market transitions is to become integrated into existing programs and make use of available resources. The electricity industry should partner with key participants who facilitate labour market transitions, training and education deliverers, and local governments in areas where mass layoffs are anticipated. It must also make sure that information on the sector's labour needs is provided to key resources, such as employment services and job placement services. To deliver effective training, the ESC needs to work with policy makers, vocational educational institutions, public employment services that administer training programs, and workers' and employers' representatives.

Finally, the Electricity Sector Council can refine the data in a number of ways, so as to better target workers capable of filling the labour gap. Options to consider include:

- fine-tuning the list of target occupations through more detailed analysis;
 - finding out which industries project excess labour scenarios; and
 - further investigating how much and what kind of training is needed to prepare workers in specific target occupations.
-

1. Available Workforce

There are skilled labour shortages in many key occupations in the electricity sector. The first section of this report looks at possible sources of workers to fill these positions.

The process of identifying the available workforce included the following steps:

- I. Occupations for which there are not enough workers were identified by the Electricity Sector Council. (These will be referred to here as “key occupations.”)
- II. Occupations that are similar to these key occupations were determined through the use of a “similarity index.” (These will be referred to here as “target occupations.”)
- III. For each target occupation, industries with a significant number of workers doing that job were identified.
 1. Industries in which employment is declining were highlighted.
 2. “Target industries” which have both falling employment levels and a significant pool of workers in one or more target occupations were selected.
 3. Finally, a specially created “Skills Transferability Matrix” was used to measure which target occupations in the target industries could most easily make a transition to a key occupation in the electricity sector.

Acronym	Description
CPMT	Commission des Partenaires du Marché du Travail
CSMO	Comités Sectoriels de Main-d’Oeuvre
	Canadian Steel Trade and Employment
CSTEC	Congress
EQ	Emploi Québec
EI	Employment Insurance
	Employment Benefits and Support
EBSM	Measures
ESC	Electricity Sector Council
	Human Resources and Skills Development
HRSDC	Canada
IAS	Industrial Adjustment Service
LMAT	Labour Management Adjustment Team
LMDA	Labour Market Development Agreement
NGO	Non-Governmental Organization
	Organization for Economic Co-operation
OECD	and Development

RAC	Re-employment Assistance Committee
SI	Similarity Index
UI	Unemployment Insurance

1.1 Key Occupations

The question of which occupations are in demand is crucial to this report. The first step was therefore to have the Electricity Sector Council (ESC) make a list of key occupations. These are positions which the sector is having trouble filling because of a lack of workers with suitable skills or education.

Each of the key occupations was given a four-digit code. This code comes from the National Occupational Classification (NOC), a system used by Human Resources and Skills Development Canada (HRSDC). The ESC identified 15 in-demand occupations.

Unfortunately, most of the data on occupations used in this report do not use the NOC system. Instead, they use a similar system developed by Statistics Canada: the National Occupational Classification for Statistics (NOC-S). While the two systems are similar, they are not interchangeable. To make it easier for the reader to identify each occupation, this report will use both codes.

Table 2 below shows the 15 key occupations in the electricity sector, along with both the NOC and NOC-S code for each one.

Table 2 – Key Occupations

NOC / NOC-S	Description
7244 / H214	Electrical Power Line & Cable Workers
7352 / H222	Power Systems & Power Station Operators
2133 / C033	Electrical & Electronics Engineers
1411 / B511	General Office Clerks
0912 / A392	Utilities Managers
7243 / H213	Power System Electricians
1453 / B553	Customer Service Information & Related Clerks
2241 / C141	Electrical & Electronics Engineering Technologists & Technicians
7311 / H411	Construction Millwrights & Industrial Mechanics (Except Textile)
7212 / H012	Contractors & Supervisors – Electrical Trades & Telecommunications Occupations
2132 / C032	Mechanical Engineers
1431 / B531	Accounting & Related Clerks
1241 / B211	Secretaries (Except Legal & Medical)
2243 / C143	Industrial Instrument Technicians & Mechanics
7351 / H221	Stationary Engineers & Auxiliary Equipment Operators

1.2 Similarity Index

Basic Explanation of Similarity Index

Different occupations use different skills and tend to employ workers with different attributes. Naturally, the ability of a worker to move to a different occupation depends in part on how his or her attributes overlap with the requirements of the new job. There are various ways to evaluate the ability of one worker to perform the work of someone in a different job: age, experience, gender, skills, and so on. One of the key attributes is education. The “Similarity Index” (SI) used here to measure the degree of similarity between key occupations and other occupations takes education as the basis for comparison.

The SI provides a figure ranging from 0 to 1 for each pairing of occupations. A score of 1 means the two occupations are perfectly similar in terms of education; conversely, 0 indicates that there is no overlap whatsoever. In other words, the closer a score is to 1, the easier the transition to the key occupation is likely to be. A detailed explanation of how the SI was constructed can be found in Appendix A.

The tables in Appendix A show the 20 most similar occupations for each key occupation, along with the number of people employed nationally in that job, the average income of those workers, and a measure that illustrates the relative transition rate in that occupation.

Transition Rates

A variety of factors influence the likelihood of changing occupations. For example, younger workers tend to have higher transition rates than older workers, so an occupation that has a lot of younger workers will have a higher relative transition rate. Similarly, all else being equal, occupations with more male workers will have a higher than average transition rate, because males have higher transition rates than females.

These factors were used to help calculate the relative transition rate for each occupation pairing. Specifically, the relative job-to-job transition rate illustrated in the tables in Appendix A was weighted according to age, sex and occupation-specific transition rates.

Income will also tend to affect transition rates, since job-to-job transitions are likely to be from a lower income to a higher income, rather than vice versa. A worker’s current income could therefore be considered as his or her “reservation wage.”² For this project, however, the focus is on workers who have been recently laid off or who are about to be laid off, and who therefore may have a reservation wage below their current income level. The relative transition rate therefore excludes income.

² The reservation wage is the minimum wage required for a worker to accept a job. If the offered salary is below the reservation wage, then the worker will turn down the offer.

Target Occupations

The purpose of developing the SI was to find the closest occupational matches for the ESC's key occupations. The remainder of the analysis uses only those occupations that both have an SI of at least 0.80 and are among the 10 most similar occupations for a given key occupation, as listed in Appendix A. Of the 150 total possible combinations (i.e., 15 key occupations multiplied by the 10 most similar occupations), this filtering produces a list of over 100 occupations.

These occupations will be considered as the target occupations to be used for further analysis in this section. It should be noted that these target occupations naturally include the key occupations that were identified by the ESC, since these occupations all have an SI of 1, but other occupations that have a similar educational makeup are also included.

1.3 Potential Sources of Labour Supply

Among the target occupations identified in the previous section as being potential matches for the ESC's key occupations, some are fairly concentrated in one industry, while others are spread out across many industries. For example, almost 78% of "Loan Officers" (a target occupation with strong educational similarities to the "Accounting and Related Clerks" key occupation) are employed in the "credit intermediation and related activities" industry. In contrast, the target occupation "Industrial Engineering and Manufacturing Technologists and Technicians" is widely dispersed: the largest concentration in any one industry is 12.5% ("transportation equipment manufacturing").

Industries with a high concentration of workers in a particular occupation are likely to be the best potential sources of labour for that occupation. As a result, for each target occupation, only those industries with a greater than average concentration of that occupation are focused on in this section.³

There are over 15,000 possible industry/occupation combinations for the five sectors. Among these, there were 1,143 instances⁴ of an industry having a large enough concentration of a given occupation to warrant inclusion as a possible labour supply source. Table 3⁵ lists these industries, as well as the number of key occupations found in each one. Some industries can potentially supply several target occupations, and some could supply large numbers. Notably, "professional, scientific, and technical services," "trade contracting," "utilities," "transportation equipment manufacturing," "prime contracting," and "federal government" are all possible sources of labour supply for more than 40 target occupations.

Further details can be found in the tables in Appendix B.⁶

³ Specifically, industries with a share of the occupational employment that was greater than the mean share plus one standard deviation were included.

⁴ It should be noted that the data used as the basis for this report were provided by a third party and in some cases data were missing or, as is the case here, presented in such a way that obtaining figures specific to the electricity sector was impossible.

⁵ It was again impossible to obtain data specific to the electricity sector here.

⁶ One table in Appendix B is missing, as it was not provided with the data.

Table 3: Potential Sources Labour Supply For Target Occupations			
NAICS	No. Target Occupations	Ave. Share of Matching Occupations	
541 Professionalscientific and technical services	88		0.230
232 Trade contracting	84		0.264
221 Utilities	51		0.252
336 Transportation equipment manufacturing	49		0.206
231 Prime contracting	48		0.179
911 Federal government public administration	45		0.120
912 Provincial and territorial public administration	39		0.126
811 Repair and maintenance	38		0.207
561 Administrative and support services	37		0.115
913 Localmunicipal and regional public administration	36		0.119
333 Machinery manufacturing	36		0.301
332 Fabricated metal product manufacturing	34		0.288
513 Broadcasting and telecommunications	33		0.266
611 Educational services	32		0.032
331 Primary metal manufacturing	28		0.132
213 Support activities for mining and oil and gas extraction	28		0.098
417 Machineryequipment and supplies wholesaler-distributors	26		0.093
211 Oil and gas extraction	26		0.208
212 Mining (except oil and gas)	24		0.367
334 Computer and electronic product manufacturing	24		0.127
322 Paper manufacturing	22		0.172
321 Wood product manufacturing	21		0.365
325 Chemical manufacturing	20		0.317
622 Hospitals	19		0.083
488 Support activities for transportation	18		0.082
524 Insurance carriers and related activities	17		0.053
522 Credit intermediation and related activities	14		0.212
311 Food manufacturing	13		0.080
621 Ambulatory health care services	13		0.092
813 Religiousgrant-makingcivicand professional and similar organizations	11		0.050
441 Motor vehicle and parts dealers	11		0.200
326 Plastics and rubber products manufacturing	10		0.129
335 Electrical equipmentappliance and component manufacturing	9		0.130
484 Truck transportation	9		0.200
562 Waste management and remediation services	7		0.232
327 Non-metallic mineral product manufacturing	6		0.075
443 Electronics and appliance stores	6		0.103
523 Securitiescommodity contractsand other financial investment and related activities	6		0.048
324 Petroleum and coal products manufacturing	6		0.168
416 Building material and supplies wholesaler-distributors	6		0.033
452 General merchandise stores	6		0.064
323 Printing and related support activities	5		0.039
414 Personal and household goods wholesaler-distributors	5		0.054
481 Air transportation	5		0.261
713 Amusementgambling and recreation industries	5		0.258
418 Miscellaneous wholesaler-distributors	5		0.027
111-112 Farms	4		0.204
337 Furniture and related product manufacturing	4		0.039
339 Miscellaneous manufacturing	4		0.048
413 Foodbeverage and tobacco wholesaler-distributors	4		0.035
482 Rail transportation	4		0.646
113 Forestry and logging	3		0.079
315 Clothing manufacturing	3		0.046
514 Information services and data processing services	3		0.042
531 Real estate	3		0.088
812 Personal and laundry services	3		0.045
532 Rental and leasing services	2		0.227
114 Fishinghunting and trapping	2		0.213
115 Support activities for agriculture and forestry	2		0.130
492 Couriers and messengers	2		0.209
511 Publishing industries	2		0.148
316 Leather and allied product manufacturing	1		0.177
412 Petroleum product wholesaler-distributors	1		0.071
413 Food beverage and tobacco wholesaler-distributors	1		0.027
415 Motor vehicle and parts wholesaler-distributors	1		0.106
417 Machinery equipment and supplies wholesaler-distributors	1		0.066
419 Wholesale agents and brokers	1		0.050
444 Building material and garden equipment and supplies dealers	1		0.049
445 Food and beverage stores	1		0.033
454 Non-store retailers	1		0.171
483 Water transportation	1		0.074

1.4 Industries with Declining Employment

A large number of industries in Canada are shedding workers. These could be a valuable source of labour for the ESC. Statistics Canada's *Labour Force Survey (LFS)* reported that close to 40 industries suffered from both a decline in employment in 2006 and, over the past decade, a significant drop in employment from the peak level.⁷ The combination of short- and long-term decline suggests that these industries are experiencing both a cyclical and structural drop in employment. Table 4 lists these declining industries.

From the perspective of provincial employment levels, a total of more than 300 industries experienced a decline in employment in 2006 and also a significant drop from their peak level over the past decade. An examination of the provincial data shows that all but eight of the industries from the *LFS* list are represented. The industries not represented at least once include: "Support Activities for Mining and Oil & Gas Extraction," "Residential Building Construction," "Specialty Trade Contractors," "Building Material and Garden Dealers," "Monetary Authorities – Central Bank," "Funds and Other Financial Vehicles," "Lessors of Non-Financial Assets," and "Management of Companies and Enterprises." In combination with the national data, this suggests that there are possible sources of excess labour in many different labour markets throughout the country.

⁷ Industries are classified according to the North American Industry Classification System (NAICS). The *Labour Force Survey* uses the NAICS 2002 classification system, while the census uses the NAICS 1997 classification system. The 2002 NAICS eliminated some categories which were present in the 1997 version. The NAICS 2002 categories closest to the eliminated categories are 2111 (211), 238 (232), 2361 & 2362 & 237 (231), 515 & 517 (513), 516 & 518 & 519 (514), 9120 (912), and 9130 (913), with the 1997 category in brackets.

Table 4: Industries With Employment Decline in 2006 & Greater Decline From Ten Year Peak							
NAICS	Max Emp. 1997-06	Min. Emp. 1997-06	Change 2005 to 2006	%Change 2005 to 2006	Below Peak	%Below Peak	
111-Crop Production	171.2	124.4	-2.2	-1.5	-31.2	-18.2	
113-Forestry and Logging	60.5	41.5	-4.8	-10.4	-19.0	-31.4	
115-Support Activities for Agriculture and Forestry	43.9	31.9	-0.6	-1.8	-10.3	-23.5	
221-Electric Power Generation Transmission & Di	133.3	114.3	-3.3	-2.6	-11.3	-8.5	
2362-Non-residential Building Construction	73.7	42.5	-3.9	-6.4	-16.6	-22.5	
311-Food Manufacturing	273.4	225.2	-12.2	-4.6	-17.7	-6.5	
312-Beverage and Tobacco Product Manufacturin	39.7	30.1	-2.6	-7.4	-7.4	-18.6	
313-Textile Mills	21.7	14.7	-0.6	-3.9	-7.0	-32.3	
314-Textile Product Mills	39.6	17.4	-4.8	-21.6	-22.2	-56.1	
315-Clothing Manufacturing	119.5	65.0	-2.3	-3.4	-54.5	-45.6	
316-Leather & Allied Product Manufacturing	14.2	5.6	-3.8	-40.4	-8.6	-60.6	
321-Wood Product Manufacturing	186.3	139.8	-2.7	-1.6	-19.8	-10.6	
322-Paper Manufacturing	121.7	94.1	-7.1	-7.0	-27.6	-22.7	
323-Printing Manufacturing	114.9	90.6	-8.7	-8.8	-24.3	-21.1	
324-Petroleum and Coal Manufacturing	20.9	16.2	-2.0	-10.9	-4.5	-21.5	
325-Chemical Manufacturing	125.0	99.3	-11.9	-10.3	-21.1	-16.9	
331-Primary Metal Manufacturing	109.2	90.1	-0.7	-0.8	-19.1	-17.5	
333-Machinery Manufacturing	138.5	103.4	-7.2	-5.5	-15.0	-10.8	
336-Transportation Equipment Manufacturing	328.7	269.6	-6.4	-2.1	-25.8	-7.8	
337-Furniture and Related Manufacturing	126.7	80.4	-3.5	-3.1	-17.2	-13.6	
339-Miscellaneous Manufacturing	103.4	80.5	-0.3	-0.3	-9.0	-8.7	
411Farm Product Wholesaler Distr.	12.7	8.7	-1.4	-12.5	-2.9	-22.8	
412-Petroleum Product Wholesaler Distr.	18.0	8.9	-0.1	-0.9	-6.4	-35.6	
413-Food and Beverage and Tobacco Wholesaler	88.0	75.0	-2.6	-3.0	-3.0	-3.4	
417-Machinery Equip and Suplies Wholesaler Dis	172.4	118.9	-0.6	-0.3	-1.4	-0.8	
447-Gasoline Stations	83.7	73.9	-1.1	-1.5	-9.8	-11.7	
453-Miscellaneous Stores Retailers	153.3	127.0	-9.8	-7.2	-26.3	-17.2	
454-Non-Store Retailers	60.4	47.7	-3.1	-6.0	-11.8	-19.5	
481-Air Transportation	71.9	58.2	-0.2	-0.3	-11.4	-15.9	
486-Pipeline Transportation	7.1	4.0	-1.0	-20.0	-3.1	-43.7	
491-Postal Service	78.4	62.1	-4.4	-5.7	-5.0	-6.4	
511-Publishing Industries	93.0	73.9	-5.4	-5.8	-5.5	-5.9	
623-Nursing & Residential Care Facilities	309.5	253.0	-1.6	-0.5	-5.3	-1.7	
711-Performing Arts Spectator Sports & Related I	118.8	86.2	-2.9	-2.6	-10.3	-8.7	
713-Amusement Gambling and Recreation Ind.	216.7	123.7	-2.3	-1.1	-9.2	-4.2	
814-Private Households	96.5	59.2	-2.7	-4.4	-37.3	-38.7	
911-Federal Government	325.2	246.3	-6.3	-2.0	-12.2	-3.8	
9120-Provincial Administration	248.1	227.9	-5.5	-2.2	-5.6	-2.3	

1.5 Selection of Target Industries

To be relevant to the ESC as a potential labour pool, an industry with falling employment must have substantial numbers of workers who possess the attributes needed in key occupations. At the national level, there are 12 industries⁸ that can supply ten or more target occupations and are also experiencing a cyclical and structural decline in employment. These are displayed in Table 5 below. Notably, all key occupations are represented at least once, either directly or via a target occupation, and so can potentially supply the electricity sector with labour. See Appendix C for further details.

Another important point is that each of these industries has tens of thousands, if not hundreds of thousands, of workers. Of course, not all key occupations can be supplied by each industry, and there is no guarantee that the type of workers required will be the ones laid off. But in theory, each of them is a potential labour pool of considerable size, and worthy of further analysis.

Table 5: Industries Able to Supply Ten or More Target Occupations & Declining Employment		
NAICS	Decline From 2005 to 2006 (Thousands)	Decline From Decade Peak (Thousands)
311-Food Manufacturing	-12.2	-17.7
325-Chemical Manufacturing	-11.9	-21.1
333-Machinery Manufacturing	-7.2	-15.0
322-Paper Manufacturing	-7.1	-27.6
336-Transportation Equipment Manufacturing	-6.4	-25.8
911-Federal Government	-6.3	-12.2
9120-Provincial Administration	-5.5	-5.6
2362-Non-residential Building Construction	-3.9	-16.6
221-Electric Power Generation Transmission & Dist.	-3.3	-11.3
321-Wood Product Manufacturing	-2.7	-19.8
331-Primary Metal Manufacturing	-0.7	-19.1
417-Machinery Equip and Suplies Wholesaler Distr.	-0.6	-1.4

Among these 12 industries, three are of particular interest. As well as being in decline, they have a relatively high concentration of workers in target occupations. The three “target industries” are:

- Chemical Manufacturing
- Integrated Forestry Companies:
 - Part of Logging
 - Wood Products
 - Paper Products
- Transportation Equipment Manufacturing.

They will be the subject of a more in-depth analysis in the next section.

⁸ Due to data limitations, the figures here are for all five sectors, rather than for electricity specifically.

1.6 Skills Transferability Matrix

To examine how easy – or not – it will be for workers in target occupations in the three target industries to move into one of the key occupations highlighted by the ESC, a Skills Transferability Matrix was developed. (See Appendix E for a technical explanation of the Matrix’s construction.)

The Skills Transferability Matrix is designed to match up each target occupation with the appropriate key occupation, and compare them. The goal is to determine which target occupations can potentially make a relatively easy transition to a key occupation. Normally, the skills transferability matrix would be organized as a chart with the key occupations along one axis and the target occupations along the other. For this report, however, the matrix is broken apart in order to provide more information about each pairing of key occupation and target occupation. Specifically, the matrix features the following:

- **Similarity Index.** This was explained in Section 1.2.
- **Skills Gap Indicator.** This highlights both the likelihood of a transition and the amount of training needed to make workers productive in their new occupations, based on the skills needed to perform the key occupation.
- **Knowledge Gap Indicator.** This is similar to the skills gap indicator, but focuses on knowledge rather than skills.
- **Income level.** The income levels for both the key and target occupations are shown, because a transition from a higher to a lower income occupation is less likely than one from a lower or similar income level.

Information about occupations, education, and income are from Canadian sources. The skills and knowledge indicators are based on U.S. sources.

The indicators (see Appendix F for a full explanation of how these are calculated) help to illustrate how closely aligned target occupations are to key occupations in terms of the required skill/knowledge levels. A number above 1.0 means that the target occupation has, on average, a *higher* skill/knowledge level than the key occupation for the skills/knowledge that are important to the key occupation. Conversely, a number below 1.0 means that the target occupation has a *lower* skills/knowledge level than the key occupation for the skills/knowledge that are important to the key occupation. The farther the indicator is from 1.0 in either direction, the greater the skills/knowledge gap.

The ideal recruits are those from occupations that have a similar level of skills/knowledge to the key occupation – in other words, those with an indicator close to 1.0. Those who are overqualified (i.e., indicator much higher than 1.0) would typically not accept a lower skilled job. Even if they do accept a lower skilled position following a layoff, there is the risk that they will continue to search for more suitable employment and therefore will not provide a permanent solution to the labour shortage. On the other hand, those occupations that have

an indicator well below 1.0 would not make suitable candidates because there would likely be significant training costs involved.

The Skills Transferability Matrix, shown below (Table 6), is organized from left to right as follows:

- The first column lists the key occupations identified by the ESC (see section 1.1).
- The second column shows direct or indirect target occupations in the target industries for each of the key occupations. These are listed in descending order of similarity to the key occupation, as measured by the Similarity Index. (The top row shows the same occupation as the key occupation, which is why the Similarity Index and Skills/Knowledge Gap Indicators are equal to 1.0, i.e., perfect similarity).
- The remaining columns show the Similarity Index, skills gap indicator, knowledge gap indicator, and average income level for each target occupation.

Mechanical engineers (NOC 2123), for example, were identified as a key occupation by the ESC. Based on a comparison of education-related factors, the SI shows that civil, electrical, chemical, industrial, and mining engineers are all quite similar to mechanical engineers in terms of their education background. Accordingly, they are listed under target occupations in the second column beside the key occupation 2123 (“mechanical engineers”).

The skills gap indicators suggest that these occupations have broadly similar skill levels for the skills that are important to the mechanical engineering profession. Moreover, the knowledge gap indicator shows that many of these other engineering occupations have knowledge at a level similar to or higher than that possessed by mechanical engineers for the knowledge that is important to mechanical engineers.

The data strongly suggest, in other words, that the listed target occupations could make a transition to the position of mechanical engineer with relative ease. These indicators cannot of course be applied to all cases in the real world. No doubt, there would be some skills and knowledge that would need to be refreshed or learnt in order to ensure a successful transition. The information presented here does not preclude the use of competency assessment tools for individual cases during the recruitment process.

Furthermore, it is insufficient to examine skill and knowledge levels alone to determine whether a job-to-job transition is likely. Income also matters greatly. There is a much greater probability of transition from an income level which is lower or comparable to that of the key occupation. In this example, the income levels of the other engineering occupations were at a similar level to that of mechanical engineers. This supports the notion that people in these other engineering occupations could transition into mechanical engineering. It should be noted, though, that the income levels for electrical, chemical, and mining engineers were somewhat higher than that of mechanical engineers, which indicates that there would be fewer transition candidates in these occupation groups.

Table 6: Skills Transferability Matrix⁹

Matrix of Inter-occupational Mobility								
Priority NOC Occupations		Occupations From Which Potential Skills Transferability Exists To Priority Occupation			Similarity Index	Skills Gap Index	Knowledge Gap Index	Income
NOC	NOC-S	NOC	NOC-S	Description				
0912	A392	0912	A392	Utilities Managers	1.00	1.00	1.00	\$69,007
		0911	A391	Manufacturing Managers	0.96	1.03	0.87	\$66,800
1453	B553	1453	B553	Customer Service Information & Related Clerks	1.00	1.00	1.00	\$23,376
		1411	B511	General Office Clerks	0.99	0.65	0.96	\$23,991
		1414	B514	Receptionists & Switchboard Operators	0.99	0.83	0.90	\$17,653
		1433	B533	Customer Service Representatives - Financial Services	0.99	0.83	0.88	\$21,473
2122	C022	2122	C022	Forestry Professionals	1.00	1.00	1.00	\$48,368
		2121	C021	Biologists & Related Scientists	0.07	0.99	1.18	\$40,975
		8211	I111	Supervisors Logging & Forestry	0.12	0.88	1.02	\$41,627
2132	C032	2132	C032	Mechanical Engineers	1.00	1.00	1.00	\$57,348
		2131	C031	Civil Engineers	0.24	1.07	1.11	\$56,197
		2133	C033	Electrical & Electronics Engineers	0.21	1.10	1.13	\$61,567
		2134	C034	Chemical Engineers	0.23	1.10	1.22	\$63,933
		2141	C041	Industrial & Manufacturing Engineers	0.78	0.92	1.24	\$55,962
		2143	C043	Mining Engineers	0.22	0.99	1.23	\$63,087
2154	C054	2154	C054	Land Surveyors	1.00	1.00	1.00	\$40,411
		2131	C031	Civil Engineers	0.51	1.15	0.97	\$56,197
		2148	C048	Other Professional Engineers n.e.c.	0.33	1.04	0.70	\$52,955
		2231	C131	Civil Engineering Technol.s & Technic.	0.93	0.88	0.71	\$38,852
2231	C131	2231	C131	Civil Engineering Technol.s & Technic.	1.00	1.00	1.00	\$38,852
		2131	C031	Civil Engineers	0.40	1.30	1.29	\$56,197
		2154	C054	Land Surveyors	0.93	1.11	1.24	\$40,411
		2234	C134	Construction Estimators	0.80	1.07	0.93	\$44,901
		2251	C151	Architectural Technol.s & Technic.	0.28	0.92	1.06	\$34,960
		2254	C154	Land Survey Technol.s & Technic.	0.89	1.00	1.03	\$28,559
2233	C133	2233	C133	Industrial Engineering & Manufacturing E76Technol.s & Technic.	1.00	1.00	1.00	\$42,161
		2132	C032	Mechanical Engineers	0.35	1.08	0.92	\$57,348
		2231	C131	Civil Engineering Technol.s & Technic.	0.52	0.91	0.89	\$38,852
		2232	C132	Mechanical Engineering Technol.s & Technic.	0.73	0.97	0.82	\$46,394
		2243	C143	Industrial Instrument Technic. & Mechanics	0.57	0.57	0.54	\$53,233
		2244	C144	Aircraft Instrument Electrical & Avionics Mechanics Technic. & Inspect	0.65	0.87	0.91	\$46,118
		2253	C153	Drafting Technol.s & Technic.	0.65	0.92	0.91	\$36,362
		2243	C143	Industrial Instrument Technic. & Mechanics	1.00	1.00	1.00	\$53,233
		2233	C133	Industrial Engineering & Manufacturing Technol.s & Technic.	0.57	1.10	1.05	\$42,161
		2241	C141	Electrical & Electronics Engineering Technol.s & Technic.	0.54	1.10	1.09	\$41,253
2242	C142	2242	C142	Electronic Service Technic. (Household & Business Equipment)	0.54	1.02	0.94	\$32,249
		2244	C144	Aircraft Instrument Electrical & Avionics Mechanics Technic. & Inspect	0.46	1.16	1.21	\$46,118
		2263	C163	Inspect. in Public & Environmental Health & Occ. Health & Safety	1.00	1.00	1.00	\$45,293
		2222	C122	Agricultural & Fish Products Inspect.	0.80	0.60	0.41	\$34,796
7212	H012	7212	H012	Contractors & Supervisors Electrical Trades & Telecom Occ.	1.00	1.00	1.00	\$54,612
		7241	H211	Electricians (Except Industrial & Power System)	0.97	0.87	0.99	\$38,249
		7242	H212	Industrial Electricians	0.96	0.51	0.58	\$51,681
		7243	H213	Power System Electricians	0.98	0.65	0.70	\$54,136
		7244	H214	Electrical Power Line & Cable Workers	0.89	0.86	0.97	\$50,336
		7245	H215	Telecom Line & Cable Workers	0.78	0.56	0.41	\$40,970
		7246	H216	Telecom Installation & Repair Workers	0.86	0.48	0.42	\$42,985
		7247	H217	Cable Television Service & Maintenance Technic.	0.82	0.56	0.41	\$37,107
7231	H311	7231	H311	Machinists & Machining & Tooling Inspect.	1.00	1.00	1.00	\$37,670
		7211	H011	Supervisors Machinists & Related Occ.	0.97	1.23	1.23	\$51,981
		7232	H312	Tool & Die Makers	0.98	0.98	1.19	\$46,527
7242	H212	7242	H212	Industrial Electricians	1.00	1.00	1.00	\$51,681
		7212	H012	Contractors & Supervisors Electrical Trades & Telecom Occ.	0.96	1.87	1.57	\$54,612
		7241	H211	Electricians (Except Industrial & Power System)	0.99	1.69	1.70	\$38,249
		7243	H213	Power System Electricians	0.95	1.29	1.16	\$54,136
		7244	H214	Electrical Power Line & Cable Workers	0.75	1.68	1.65	\$50,336
		7245	H215	Telecom Line & Cable Workers	0.60	1.15	0.72	\$40,970
		7246	H216	Telecom Installation & Repair Workers	0.71	1.00	0.70	\$42,985
		7317	H417	Textile Machinery Mechanics & Repairers	0.27	1.25	0.96	\$30,196

⁹ Due to lack of access to the original data, figures specific to the electricity sector could not be presented separately. Table 6 therefore shows data for all five sectors combined.

Matrix of Inter-occupational Mobility								
Priority NOC	NOC Occupations NOC-S	Occupations From Which Potential Skills Transferability Exists To Priority Occupation		Description	Similarity Index	Skills Gap Index	Knowledge Gap Index	Income
		NOC	NOC-S					
7243	H213	7243	H213	Power System Electricians	1.00	1.00	1.00	\$54,136.00
		7212	H012	Contractors & Supervisors Electrical Trades & Telecom Occ.	0.98	1.24	1.09	\$54,612.00
		7241	H211	Electricians (Except Industrial & Power System)	0.93	1.14	1.12	\$38,249.00
		7242	H212	Industrial Electricians	0.95	0.68	0.66	\$51,681.00
7252	H112	7252	H112	Steamfitters Pipefitters & Sprinkler System Installers	1.00	1.00	1.00	\$45,810.00
		7213	H013	Contractors & Supervisors Pipefitting Trades	0.87	0.84	0.62	\$53,978.00
		7251	H111	Plumbers	0.68	1.00	1.00	\$35,441.00
		7253	H113	Gas Fitters	0.95	0.98	0.98	\$39,870.00
		7311	H411	Construction Millwrights & Industrial Mechanics (Except Textile)	0.43	0.76	0.53	\$48,645.00
		7253	H113	Gas Fitters	0.95	0.98	0.98	\$39,870.00
7265	H326	7265	H326	Welders & Related Machine Operators	1.00	1.00	1.00	\$34,946.00
		7214	H014	Contractors & Supervisors Metal Forming Shaping & Erecting Trades	0.97	1.67	1.79	\$52,958.00
		7262	H322	Boilermakers	0.65	1.10	1.38	\$42,019.00
		7263	H323	Structural Metal & Platework Fabricators & Fitters	0.98	0.83	1.26	\$36,009.00
		7264	H324	Ironworkers	0.94	0.64	1.09	\$37,837.00
		7311	H411	Construction Millwrights & Industrial Mechanics (Except Textile)	0.46	1.37	1.41	\$48,645.00
7311	H411	7311	H411	Construction Millwrights & Industrial Mechanics (Except Textile)	1.00	1.00	1.00	\$48,645.00
		7216	H016	Contractors & Supervisors Mechanic Trades	0.76	1.28	1.33	\$47,184.00
		7316	H416	Machine Fitters	0.78	0.80	0.92	\$37,925.00
7312	H412	7312	H412	Heavy-Duty Equipment Mechanics	1.00	1.00	1.00	\$41,177.00
		7216	H016	Contractors & Supervisors Mechanic Trades	0.93	1.23	1.29	\$47,184.00
		7315	H415	Aircraft Mechanics & Aircraft Inspect.	0.97	1.11	1.33	\$45,078.00
		7321	H421	Automotive Service Technic. Truck Mechanics & Mechanical Repairers	1.00	1.09	1.14	\$31,536.00
		7352	H222	Power Systems & Power Station Operators	0.71	0.64	0.57	\$59,361.00
7351	H221	7351	H221	Stationary Engineers & Auxiliary Equipment Operators	1.00	1.00	1.00	\$48,591.00
		7352	H222	Power Systems & Power Station Operators	0.72	0.51	0.41	\$59,361.00
7352	H222	7352	H222	Power Systems & Power Station Operators	1.00	1.00	1.00	\$59,361.00
		7351	H221	Stationary Engineers & Auxiliary Equipment Operators	0.72	1.68	1.60	\$48,591.00
7372	H622	7372	H622	Drillers & Blasters - Surface Mining Quarrying & Construction	1.00	1.00	1.00	\$39,848.00
		7217	H017	Contractors & Supervisors Heavy Construction Equipment Crews	0.98	1.32	0.98	\$46,405.00
		7373	H623	Water Well Drillers	0.98	0.83	0.89	\$28,964.00
7411	H711	7411	H711	Truck Drivers	1.00	1.00	1.00	\$33,954.00
		7412	H712	Bus Drivers & Subway & Other Transit Operators	0.97	0.90	0.82	\$25,477.00
		7421	H611	Heavy Equipment Operators (Except Crane)	1.00	1.00	1.00	\$35,325.00
		7422	H612	Public Works Maintenance Equipment Operators	1.00	0.95	0.95	\$30,824.00
7421	H611	7421	H611	Heavy Equipment Operators (Except Crane)	1.00	1.00	1.00	\$35,325.00
		7422	H612	Public Works Maintenance Equipment Operators	1.00	0.95	0.95	\$30,824.00
8231	I131	8231	I131	Underground Production & Development Miners	1.00	1.00	1.00	\$52,776.00
		8221	I121	Supervisors Mining & Quarrying	0.96	1.33	0.89	\$59,120.00
		8411	I141	Underground Mine Service & Support Workers	1.00	0.93	1.44	\$46,342.00
		8614	I214	Mine Labourers	1.00	1.11	0.99	\$38,927.00
9231	J111	9231	J111	Central Control & Process Operators Mineral & Metal Processing	1.00	1.00	1.00	\$48,164.00
		9211	J011	Supervisors Mineral & Metal Processing	1.00	1.71	1.62	\$55,194.00
		9411	J121	Machine Operators Mineral & Metal Processing	0.99	1.21	1.06	\$38,882.00
		9415	J125	Inspect. & Testers Mineral & Metal Processing	0.99	1.19	1.29	\$39,161.00
9232	J112	9232	J112	Petroleum Gas & Chemical Process Operators	1.00	1.00	1.00	\$59,418.00
		9212	J012	Supervisors Petroleum Gas & Chemical Processing & Utilities	0.97	1.50	1.54	\$61,137.00
		9421	J131	Chemical Plant Machine Operators	0.93	0.78	0.94	\$34,480.00
8222	I122	8222	I122	Supervisors Oil & Gas Drilling & Service	1.00	1.00	1.00	\$66,730.00
		8232	I132	Oil & Gas Well Drillers Servicers Testers & Related Workers	1.00	0.78	0.82	\$49,330.00
		8412	I142	Oil & Gas Well Drilling Workers & Services Operators	0.99	1.14	1.02	\$44,329.00
8232	I132	8232	I132	Oil & Gas Well Drillers Servicers Testers & Related Workers	1.00	1.00	1.00	\$49,330
		8222	I122	Supervisors Oil & Gas Drilling & Service	1.00	1.04	0.74	\$66,730
		8412	I142	Oil & Gas Well Drilling Workers & Services Operators	1.00	1.31	1.02	\$44,329
		8615	I215	Oil & Gas Drilling Servicing & Related Labourers	1.00	0.59	0.50	\$28,013
8412	I142	8412	I142	Oil & Gas Well Drilling Workers & Services Operators	1.00	1.00	1.00	\$44,329
		8222	I122	Supervisors Oil & Gas Drilling & Service	0.99	0.80	0.70	\$66,730
		8232	I132	Oil & Gas Well Drillers Servicers Testers & Related Workers	1.00	0.70	0.82	\$49,330
		8615	I215	Oil & Gas Drilling Servicing & Related Labourers	1.00	0.43	0.41	\$28,013

2. Labour Market Transitions

The first section of this report looked at *who* might be available and suitable to fill labour gaps in the electricity sector. This section considers the question of *how* these individuals can best move into the sector, with a particular focus on labour market transition programs. It will examine transition programs in Canada, the United States, and other OECD nations and analyze research that has been conducted into the results and effectiveness of various transition measures. The section will end with an overview of current best practices.

In general, transition programs are designed to aid people making work-related changes, such as the transition from non-employment to employment and job-to-job transition. Most of these programs are focused on a specific group who experience difficulty in making the transition from non-employment to work, such as youth entering the workforce, recent immigrants, or individuals who have been unemployed on a long-term basis.

One group that is often the focus of transition measures is workers laid off en masse as a result of downsizing or bankruptcy. This group will be the prime focus of this section, given that one of the main aims of the research is to explore the possibility of workers from declining industries supplying labour to industries with rising employment.

2.1 Transition Programs

In order to understand transition programs for laid-off workers, it is helpful to first understand the broad array of programs and measures that are available for displaced workers in general. Transition programs for workers who have recently been or will soon be laid off are similar to these programs, although there are some differences, which will be discussed later.

In industrialized countries, displaced workers are helped by an assortment of labour market programs. These programs have a variety of goals and approaches. They are commonly divided into so-called *passive* and *active* labour market programs. Passive labour market programs are mainly income support measures, such as unemployment insurance benefits and subsidies for early retirement. Active labour market policies are designed to improve the employability of displaced workers and assist them in finding a new job.

Active programs include counselling, job search and job placement assistance, retraining programs, job creation, and employment subsidies. These measures are generally available to all unemployed people. Some programs, however, are restricted to those who are at greatest risk of long-term unemployment,¹⁰ which typically excludes highly educated or skilled workers. Others are only available for large-scale layoffs, such as rapid response worker adjustment programs.

The policy in many countries is to begin with low-cost measures (e.g., counselling, job search information) for those who have been unemployed for a short time and increase the intensity and cost of measures for workers who have been unemployed for longer periods.

The major active transition measures are as follows:¹¹

- **Rapid response programs.** For large-scale layoffs, an industrial adjustment specialist or team facilitates the organization and operation of a re-employment assistance committee (RAC) or labour management adjustment team (LMAT). An RAC or LMAT is an ad hoc group of workers and managers from the restructuring enterprise who organize services to help displaced workers quickly find new, productive jobs. Many of these services are described below and are often tailored for individual needs.

The policy goal of preventing displaced workers from becoming unemployed on a long-term basis has led some analysts to promote early action for “at risk” groups. Counselling offered in the early weeks of unemployment may be an effective intervention for preventing extended periods of unemployment. This is desirable because after a lengthy period of unemployment, displaced workers may begin to lose their attachment to the workforce and their skills may begin to deteriorate.

¹⁰ There are various definitions of “at risk” groups, but this term typically includes people who: are suffering from repeat unemployment; have lower educational attainment; are disabled; belong to a minority group; or are youths or older workers. The question of who is most at risk also depends on local economic conditions. The literature on worker profiling was developed expressly to examine this issue.

¹¹ This section is based on discussion in World Bank (2003) and Hansen (2002).

The government plays a critical role in creating a regulatory environment that gives firms incentives and support for making commitments to help place workers in new jobs. Most importantly, the several months' advance notice of impending layoff required by provincial law in Canada is a factor that allows an RAC or LMAT time to organize and formulate a program.

- **Advance notice.** Advance notice of layoffs provides an advantage to the workers by allowing enough time for employment search and training services to be deployed. Clearly, the quicker these services are made available, the sooner workers can be helped to find employment.

- **Pre-layoff advice and counselling.** Services and support for displaced workers may include elements of trauma, financial, and life counselling. Telephone crisis lines, counselling services, and referral systems are often instituted by local NGOs or public employment services to help displaced workers and their families deal with the emotional impact of job loss and unemployment.

Such seemingly modest efforts can have a major impact on helping workers adjust emotionally to job loss. They will be better able to understand that the job loss was not due to their inadequacies, that other workers and families face the same challenges, and that they have not been abandoned as individuals by their companies and communities just because they have been temporarily displaced from their productive position in society.

- **Job search assistance.** Job search assistance involves various measures, including: job placement help, which tries to match workers with opportunities in the job market; job fairs; peer support programs; seminars that explore new opportunities; time off for job searching before termination of the current job; childcare services; and help in building the skills needed to find a new job (interview skills, personal skill assessment, writing job applications, using job clubs, etc.).

Workers displaced after many years of work in the same occupation or with the same employer may not have an accurate idea of labour demand in the same industry, occupation, and region. Measures to help displaced workers with their job search are typically delivered through public employment services and aim to improve the flow of information between potential employers and job-seekers. Targeted job-matching, for example, can help produce a better (or faster) match between employer requirements and job-seeker characteristics.

When layoffs are anticipated at a particular workplace, a job search area can be set up there. This may provide telephone access, sample resumes, office equipment, computer hook-ups to national job postings, and so on. Workers may be more likely to use this than official job service agencies. Being able to come to the plant and utilize services there has often been shown to help maintain morale and sustain job search activities (Batt 1983).

- **Training.** Training and skills upgrading are provided so that the displaced workers can find employment elsewhere. Training can be provided by way of classroom teaching or on-the-job training. There are various course types, including:

- basic remedial training (e.g., acquiring basic skills like languages and mathematics);
- teaching behavioural skills, self-confidence, motivation, work discipline, etc.;
- retraining – i.e., teaching new skills to people whose skills have become outdated, in order to reduce skill mismatches and facilitate relocation; and
- training in small business or micro-enterprise management to help some of the displaced workers become self-employed.

Combination packages can be constructed for individuals – for instance, some job search training, some classroom retraining, and some on-the-job training or work experience.

- **Employee enterprise.** The resources and facilities of the enterprise are used to create jobs for displaced workers by contracting out services needed by the enterprise or by setting up a range of facilities, from simple workspaces to more sophisticated business incubators, which provide resources to help start-up companies.

- **Job creation.** Local governments, NGOs, and community self-help groups, either alone or in partnership, develop employment opportunities at a local level. These can include large-scale, labour-intensive public works programs, local community activities, or small enterprise development projects.

- **Wage subsidies and re-employment bonuses.** Wage subsidies are provided to encourage companies to hire designated individuals. These individuals are typically those who have been unemployed for long periods or those deemed to be most at risk of long-term unemployment. They provide an incentive for workers to get back to work quickly by paying, for a certain period of time, the difference between the worker's wage before being laid-off and the worker's re-employment wage.

Re-employment bonuses are paid to the individual if they find gainful employment before a predetermined cut-off point while receiving unemployment insurance payments. They are essentially lump sum payments to individuals for starting a new job.

The justification often given for such interventions is that displaced workers (particularly high-wage workers) might set unrealistically high reservation wages and therefore remain out of work too long while waiting for an adequately paying job.

Mobility subsidies may also be required to enable workers to move their families so that they can accept jobs in distant locations. Subsidies can also reimburse job search expenses, such as travel required for interviews.

- **Workforce pooling.** Another approach that is being examined is workforce pooling, whereby different companies or industries with different cyclical or seasonal employment demand use the same pool of workers at different times. The main advantage is that the workers' human capital is kept up-to-date and they are therefore more productive.¹²

Recently, there has tended to be a greater emphasis on active labour market measures, as well as methods to increase the effectiveness and cost efficiency of such measures. Active

¹² Marineteck South Ltd (2004).

labour market measures or programs are thought to encourage re-employment more than passive programs. For example, the OECD Jobs Strategy emphasizes the benefits of active programs.

Some trends designed to increase the effectiveness of the programs include:

- greater use of self-service and computer-based information delivery systems;
 - decentralized delivery of services (this has occurred in the U.S., Canada, France, Italy, Sweden, and the U.K.);
 - delivery of most, if not all, services at the local level from one location (i.e., the “one-stop shop” model);
 - for large-scale layoffs, placement of the worker assistance resource centre or transition centre on or near the work site; and
 - increased emphasis on demand-led training, so that the skills needed by business are taken into account.
-

2.2 Canadian Approaches

Delivery of Labour Market Programs in Canada

In Canada, labour market initiatives include passive and active programs. The federal government is responsible for passive support via Employment Insurance (EI). Federal, provincial, and territorial governments are responsible for various aspects of active labour market programs. The federal government, for example, is responsible for delivering active labour market programs that are national in scope, such as those concerned with inter-provincial mobility.¹³

Historically, the federal government has played a key role in all labour market matters, including employment training and career development for adults. Increasingly, however, this role is shared with or has devolved to the provinces and territories, many of whom have requested the transfer of federal funding and responsibilities through Labour Market Development Agreements, or LMDAs.

To date, eight provinces and territories (New Brunswick, Quebec, Ontario, Manitoba, Saskatchewan, Alberta, Northwest Territories, and Nunavut) have taken on the full delivery of career development programs and services – with the exception of providing labour market information, which is a shared responsibility.

Five provinces and territories (Newfoundland and Labrador, Prince Edward Island, Nova Scotia, British Columbia, and the Yukon) jointly plan these programs and services with the federal department responsible for labour market matters, Human Resources and Skills Development Canada (HRSDC); HRSDC is in charge of actually delivering the programs and services.

Efforts at co-ordination among the federal and provincial or territorial jurisdictions occur through the Forum of Labour Market Ministers.¹⁴ In addition, HRSDC provides universal access to labour market information services and labour exchange services, largely through a self-serve approach.

Access to federal Employment Benefits and Support Measures (EBSMs) is based on labour market need and eligibility. Short-term assistance includes employment counselling, job search assistance, targeted wage subsidies, earnings supplements, and financial assistance to encourage EI clients to become self-employed. Long-term assistance includes training, job creation, and community development projects.¹⁵

Where active labour market measures are delivered by provincial/territorial governments through LMDAs, it is expected that the benefits and measures will be “similar” to those outlined in the federal EI Act and meet specified guidelines. The range of labour market measures in each province is thus broadly similar. In Newfoundland and Labrador and New Brunswick, for example, the federal model is followed without any major changes. The Quebec model is somewhat different from other provinces, and represents a fairly advanced

¹³ HRDC (2000).

¹⁴ HRDC (2002).

¹⁵ Ibid.

approach to labour market program delivery. It is thus worth looking at in more detail. Ontario is the most recent LMDA signatory, and its case is also covered in more detail below.

LMDA Case Study – Quebec

Quebec signed one of the first LMDAs with the federal government and has evolved its services over time. Emploi Québec (EQ) has ten measures available to assist unemployed workers:

- Labour training
- Support for self-employment
- Wage subsidies
- Return to work supplement
- Employment preparation
- Employment search and job placement
- Youth programs
- Social integration
- Assistance for disabled people
- Help for immigrants and visible minorities

The main distinction between what is done in Quebec and what is done in other provinces is not in the measures themselves, but rather in the way they are delivered to the clientele. Services delivered by EQ are decentralized, with 17 administrative regions and 150 local employment centres throughout the province. Programs offered in different regions are adapted to that area's needs.

When there is an excess supply in one region in a particular industry (e.g., forestry sector), there is probably some excess demand in another region in another industry (e.g., mining). EQ and its local employment centres try to help restore some sort of equilibrium between two or more regions or sectors. Each region is quite autonomous, however, and EQ doesn't administer the same medicine to all of them.

Once a year, EQ does an exhaustive analysis of its labour market, both for Quebec as a whole and for each region. This is done to determine labour demand for industries and occupations and sources of labour supply. By the standards of other countries or other Canadian provinces, this is an extensive and sophisticated exercise. EQ can accordingly fine tune its interventions to a greater degree and be more efficient.

To support companies, EQ has another list of measures:

- Recruitment and hiring
 - Human resources management
 - Occupational qualification
 - Labour adjustment committee for mass layoffs
-

- 1% training investment
- Training and apprenticeship
- Technical and financial aid for creating jobs
- Labour market information

One measure unique to Quebec is the “1% law on training.” In June 1995, the Quebec government passed a law which obliges every employer with a payroll in excess of \$250 thousand¹⁶ to invest 1% of its annual payroll on training. If an employer doesn’t invest that amount, all or part of the money is provided to a labour training fund. The objective of the law is to facilitate employment and labour mobility.

Bérubé (2005) examined the 1% law on training and found mixed results. One objective of the law was to raise training levels from below the Canadian provincial average to the provincial average. From that perspective, the program is a success. On the other hand, it seems that training in Quebec reached a ceiling around the national average by the early 2000s, so its effects would seem to have plateaued.

According to a survey made public in March 2002, 40% of employers were against the measure. Since that time, the government has moved to cut the red tape that helped stoke the negative opinion. Consequently, by the end of 2006 even employers’ associations were largely in favour of the law, as witnessed by their press releases at that time.

Overall, the law has been deemed a success for larger companies, as 92% of them still invest in the program. And despite small- and medium-sized enterprises no longer being covered by the law, they still provide training to their workers, although this tends to be less formal (e.g., a lot of on-the-job training) than that provided by big firms.

EQ also supports “learning by doing.” In this program, more experienced workers accompany and teach junior workers (or apprentices) in a structured manner. The program leads to a certificate, although not all trades are part of the program. EQ supports, follows up on, and finances the program by way of tax credits for the companies involved.

Another unique aspect of the Quebec government’s approach is that it partners with different groups. The Commission des partenaires du marché du travail (CPMT) is a provincial body that has representatives from employers, unions, academia, community organizations, and government agencies; its aim is to improve the labour market mechanism. It serves as an intermediary between the Quebec government and partner organizations directly involved with employment and labour force development. The CPMT has a network of partners, among whom are 30 CSMOs. These are akin to the Canadian Sector Councils; their mandates are to plan out the specific needs of each sector, to propose measures to stabilize employment and reduce unemployment, and to develop continuous professional training.

¹⁶ This was changed to \$1 million in January 2004.

LMDA Case Study – Ontario

Ontario's LMDA took effect in January 1, 2007, and the provincial government recently unveiled its rapid response program. Under Ontario's Rapid Re-employment Training Service, a team is deployed to a community when a public announcement is made regarding a major downsizing or closing. The response team is made up of representatives from relevant government ministries; they partner with community organizations, municipal government officials, and union representatives to develop an action plan.

The action plan is put in place within 30 days of the initial response. It identifies programs and services available to workers, including: quick access to customized training, skills upgrading, job placement, income support, relocation services, and workplace literacy programs to support workers in learning new processes and technologies. Affected workers are offered one-stop access to these services.

A local adjustment committee, led by an independent chair, is established to co-ordinate the implementation of the action plan. Members of the committee may be drawn from among the affected workers, the union, the employer, and the local community.

The Ontario government claims that each laid-off worker will have an action plan within 15 days of their initial assessment. Individual plans for workers are developed based on their skills, abilities, and goals; gaps between those skills and the jobs available in the marketplace are identified and addressed.

2.3 Evaluation of Transition Measures

This section assesses the success of those transition measures which are of most interest here – namely, work-to-work and recent-layoff-to-work transition programs, most often for people deemed to be “at risk” of long-term unemployment. In particular, the results of job search assistance programs, advance notice of layoffs, rapid response programs, wage subsidies and earnings supplements, training programs, and worker profiling will be discussed.

Most research on work-to-work or recent-layoff-to-work transition programs tends to focus on government programs and joint business, labour, and government programs that are used in mass layoff situations. Also, most of the information on cost effectiveness is based on government programs; there is much less available information on the efficiency and especially the cost effectiveness of company programs.

Overall, the evidence on the success of transition measures is mixed. The weight of evidence suggests that job search assistance, advance notice, and rapid response programs have positive effects on outcomes at a reasonable cost. On other hand, wage subsidies and training seem to be less beneficial, particularly in light of their high cost.

It should be kept in mind, however, that the evidence is not consistent across all studies. There can be large differences in outcomes in different countries and time periods, which implies that the institutional structure and economic conditions of the country affect the results. Also, results will differ depending on how the analysis is done.

The following sections look at the research on each measure in closer detail.

Job Search Assistance

A number of studies have concluded that job search assistance is a relatively cheap and efficient form of intervention. This is particularly true at the early stages of displacement, when workers are still attached to the workplace, especially if the service is provided before workers disperse from the area of plant closure or mass layoffs.

Leigh (1993) argues that many workers possess sufficient marketable skills and are able to find new jobs with some assistance. Lauzon (1995) corroborated that view, based on the speed with which many displaced workers started new jobs in the 1988-90 period.

Not only does job search assistance provide relatively cheap interventions with generally the largest relative payoff, but the research across OECD countries suggests that job search assistance provides positive results on a consistent basis and appears to be effective for most groups of unemployed people (Fay 1996).¹⁷

Some studies in the U.S. suggest that job search training yields such positive benefits in terms of shorter unemployment periods that participation should be mandatory (Decker and Corson 1995). Evaluation of U.S. displaced worker demonstration projects indicated that job

¹⁷ Evans-Klock et al. (1998).

search assistance speeds up the re-employment of displaced workers, especially if intervention can begin before workers disperse after layoffs and plant closings.¹⁸ Finally, evidence from the Buffalo Dislocation Demonstration Project, the Texas Worker Adjustment Demonstration, and the New Jersey Unemployment Insurance Re-employment project indicates that job search assistance improves a variety of labour market outcomes – including earnings, placement rates, and employment rates – and reduces the use of UI (Leigh 1991).¹⁹

Advance Notice

Various beneficial effects are attributed to advance notice of layoffs. This measure has existed in Europe for almost a century, and by now it exists in almost all OECD countries.²⁰ Hansen (2001) indicates that workers are better helped by interventions while they are still working than they are after they have been unemployed for a few months. Sohlman and Turnham (1994) state that if the advance notice is not too short (two or three weeks) and not too long (one or two years), it may help shorten the duration of unemployment of displaced workers.

Evaluations in the United States show that the probability of becoming unemployed is reduced by advance notice, rather than the period of unemployment once unemployment occurs. Workers not receiving advance notice had on average one month longer time in unemployment than workers receiving advance notice.

Evans-Klock et al. (1998) state that advance notice is associated with shorter periods of unemployment and replacement jobs with higher wages. It also allows workers who had enjoyed long-term job security to adjust to the shock emotionally before having to deal with the economic repercussions of job loss and the uncertainties of finding a new one. It was also found that paying severance to all workers, including those who found replacement jobs before dismissal, helped give workers incentive to start their job search before they were released (Batt 1983).

Unlike other types of employment protection legislation, which discourage employers from hiring more workers, the advance notice rule does not seem to have deterred employers from hiring. Just as importantly, the rule has not had a negative effect on the productivity of the workforce during the advance notification period (Fretwell 1992; OECD 1991). Indeed, some case studies have shown that production was above quotas at certain plants during the advance notice period.

Rapid Response Programs

Impressive results have occurred in North America when skilled industrial adjustment specialists have organized rapid response worker adjustments using RACs or LMATs. The early 1980s' pilot rapid response worker adjustment programs in the United States were so

¹⁸ Ibid.

¹⁹ Lauzon (1995).

²⁰ Sohlman and Turnham (1994).

successful that the U.S. Congress passed legislation in 1988 to make them the cornerstone of the American system to soften the impacts of mass layoffs and displacement on workers and communities. Since that time, every state government and many local governments in the United States have established displaced worker units and trained industrial adjustment specialists to provide leadership and technical assistance to employers faced with possible layoffs.²¹

The Manpower Consultative Service of Canada Employment and Immigration was noted in the early 1980s for its consolidated and co-operative approach to re-deploying displaced workers. The lynchpin of this program was establishing a Manpower Adjustment Committee as soon as a plant closure or massive retrenchment was announced. The committees were composed of production and personnel management, union officers, representatives for salaried non-union employees, and a Manpower Consultative Service agent. The company and local and provincial governments shared the expenses.

The activities of the joint labour-management Manpower Adjustment Committee included:

- signing a standard agreement setting the work procedures for the committee;
- taking a survey of the displaced workers;
- creating a one-page summary of each worker's skills, training, and willingness to relocate;
- determining demand for the workers;
- networking among the local business community and the company's suppliers and customers;
- taking stock of which unions were hiring in the industry; and
- contributing local and regional labour market information.

In 1980, 365 companies and worker groups had signed such agreements in Canada, affecting 200,000 workers. Two-thirds of the participants found replacement work before or shortly after their retrenchment. In one of the largest cases, a layoff of 2,000 workers at an automotive plant, 94% of participating workers found jobs at a total cost of \$60,000.

Not all evaluations of the Canadian experience have proven positive, however. An evaluation of the Industrial Adjustment Service (IAS) conducted by EKOS revealed "no hard labour force benefits." Overall, IAS was deemed less effective than the alternatives used by the general population of those laid off between 1988 and 1991 (EKOS 1993). EKOS noted in their evaluation that IAS participants spend more time on job searches, but the extra search time did not result in more job interviews than for non-IAS participants. Also, IAS participants earned about \$7,200 less than non-participants upon starting new jobs. In their response to the EKOS evaluation, the IAS management pointed out that the

²¹ Hansen (2002).

IAS was more of a “process” than a “program” and claimed that the fact that it was evaluated (a) in the same manner as the Canadian Jobs Strategy, (b) mainly on its placement capabilities, and (c) in a time of “serious economic agitation” (1989-91) “helps explain the poor showing.”²²

Based on the divergent findings in these studies, the results of these programs would seem to depend to some extent on the economic climate. A weak economic climate can cause a program or measure that performed well in an earlier period to have poor results at another time.

An assessment of the U.S. approach by Hansen (2002) noted that the speed of the state government’s response to downsizing and its leadership role in the process has an impact on the results. Hansen also outlined that the keys to a successful RAC or LMAT process to assist displaced workers include:

- an employer who is willing to provide assistance to the displaced workers and to support the RAC;
- a small group of competent employer and worker representatives who are willing to serve on the RAC or LMAT; and
- a qualified, trained person in the community or region who is (or can function as) an industrial adjustment specialist and provide ongoing guidance and technical assistance to the employers and worker representatives who want to use the RAC or LMAT process.

Wage Subsidies and Earnings Supplements

Public labour market policies often feature wage or other hiring subsidies. Evaluations suggest that in general terms subsidies to employers have a relatively high cost per net job created, and may result in a substantial deadweight loss. In other words, the program subsidizes employers to do what they would have done otherwise without the subsidy.

A wage subsidy program is less a job creation exercise than a program aimed at getting jobs for a certain group of people. This is why wage subsidies typically are focused on the most disadvantaged groups. From the perspective of displaced workers, these programs would be aimed at those with the lowest skills, older workers, and those in depressed areas for whom other measures have proven to be ineffective.

Incentives or subsidies include measures to reduce the costs to the job-seeker in finding, accepting, or keeping a job. For example, earning supplements have been used in some OECD countries to compensate re-employed workers for the loss of income when they accept new jobs at lower pay. This is cost effective only if the subsidy is both lower than the worker’s unemployment benefit and provided for a relatively short duration. Some countries have found that combining targeted subsidies with job search assistance is effective in

²² Lauzon (1995).

increasing re-employment rates and particularly effective in increasing workers' acceptance of jobs that are distasteful in some way.

In Canada, HRSDC examined the effectiveness of earnings supplements provided through the Earnings Supplementation Project. The component involving displaced workers was designed to get workers back to work quickly, even at the cost of taking a lower paying job. The analysis of the program results showed that job seekers who received supplements behaved much like those who did not receive supplements. The only difference was that supplement group members were slightly more likely to consider new types of jobs, including those that paid less than their previous job. The earnings supplement also caused a few displaced workers to find full-time employment slightly sooner than they would have otherwise done.

Training

Most of the research on supply-side training programs related to transition efforts focuses on government-sponsored training and mass layoff situations. Most of the information in this section therefore addresses these types of initiatives.

The evidence on the effectiveness of government training programs is mixed. It has generally been found to be not cost effective, compared with other methods of support. Reviews of retraining found limited impacts (Dar and Gill 1995, 1998; Dar and Tzannatos 1999; Fay 1996). The evaluations revealed that retraining programs were generally no more effective than job search help in increasing either the likelihood of re-employment probabilities or post-intervention earnings, and they cost much more: namely, two to four times as much as job-search assistance.

Evaluation of the effects of retraining programs for displaced workers in the U.S. and Europe vary from no effect to a somewhat positive impact on the chance of finding a job (Auer 1991; Decker and Corson 1995; Leigh 1994). This mixed effect is attributed to (a) difficulties in designing an effective program and allocating sufficient funds, particularly for support services and income maintenance during retraining, and (b) the use of such programs under inappropriate conditions. In the U.S., less than 10% of those eligible participate, due in large part to inadequate funding.²³

Jacobson, Lalonde, and Sullivan (1994) indicate, on the basis of a detailed analysis of the Allegheny County Displaced Workers Education Training Program, that while earnings of trainees did increase following training, the returns were far below the forgone earnings given up during the training period. Moreover, the participants did not return to their pre-displacement earnings levels.

When examining training programs, it is important to distinguish the type of training and what the training is for. For example, there is classroom training and on-the-job training. Training can be used to refresh existing skills or teach new skills. Training programs can be short or long term. In the literature there is also a distinction between training related to

²³ Evans-Klock et al. (1998).

occupations in demand (i.e., demand-led training) and other types of training. Studies have pointed out some differences in the various training approaches, as discussed below.

Classroom training. Longer classroom training is the most expensive retraining method. It is probably justified only when occupational change is required; in this situation, it provides displaced workers with skills that are marketable in the local economy. Providing income support for a longer period of time drives up the cost of such programs, but without it, the displaced workers most in need of assistance will be the least likely to participate. In the U.S., for example, the absence of public childcare programs has been shown to limit women's participation in retraining programs.²⁴ Leigh (1991) reports that evidence from four major demonstration projects in the U.S. indicates that classroom retraining fails to have a greater impact on later earnings and employment than job search assistance alone.²⁵

On-the-job training. There is some evidence that on-the-job training provides greater benefits over classroom training and even job search assistance. Leigh (1991) argues that the New Jersey UI Demonstration showed benefits as high as \$3,000 per quarter for those who took on-the-job training.²⁶ The national U.S. Job Training Partnership Act, targeting disadvantaged adults and youth, also had positive results for on-the-job training. The specific training services offered in this program generally fall into one of two categories: classroom training and on-the-job training. Classroom training includes both occupational skills training and training in basic academic skills. On-the-job training consists of subsidized training that usually takes place as part of a paying job, generally in the private sector. At the time the evaluation was done, the net cost of training per participant averaged approximately \$1,200 for adults and over \$2,000 for youth – making it one of the least expensive training programs in the U.S. Evaluation results show that the program's effects on earnings are significant for both men and women (an increase of over 10%), with short-term classroom training having the least beneficial effects and on-the-job training being more beneficial. Follow-up data show that the effects for adults continued over five years, although they become smaller and statistically insignificant.²⁷

Skills upgrades. A review of evaluations of U.S. training programs suggested that short-term training designed to upgrade workers' existing skills was more effective than furnishing training in new occupations (Leigh 1994). Such training can be made available on weekends and evenings to increase participation rates. It was also found that workers re-employed in the same industry or occupation tended to suffer less of an earnings loss when re-employed.²⁸

Retraining. Evaluations of three retraining programs for U.S. auto workers show varying results. In San Jose, a non-scientific evaluation indicated high placement rates, while in Buffalo and Michigan during the same period, scientific evaluations showed that these programs were ineffective. More generally, non-scientific evaluations indicate that

²⁴ Ibid.

²⁵ Lauzon (1995)

²⁶ Ibid.

²⁷ Dar and Tzannatos (1999).

²⁸ Evans-Klock et al. (1998)

these programs are very effective, with high placement rates of participant workers in jobs following completion of the program (Alfthan and Janzon 1994). More reliable evaluations challenge this optimism: although they find that some retraining programs may result in a modest increase in the chance of re-employment, the result is often statistically insignificant (Corson, Long, and Maynard 1985). The results for post-program earnings are even more discouraging: the wage effects on retraining participants, compared to other workers, are rarely positive and in most cases negative (OECD 1991). In all, from an economic perspective and based on the evidence of employment/wage impacts, retraining seems to cause high deadweight losses. These results compare unfavourably to the effects of programs for the long-term unemployed, where there is some evidence of positive impacts.²⁹

An interesting Canadian case study is the Worker Adjustment Program run by the Canadian Steel Trade and Employment Congress (CSTEC) for workers downsized by the mining and primary metals industries. This is a good example of a training initiative with positive results. It is noteworthy for (a) having an industry-wide approach and (b) offering a much greater focus on training and retraining than other transition programs. Its comprehensive training services, based on partnerships between industry and education/training institutions (especially colleges and CEGEPs), include:³⁰

- Prior Learning Assessment (PLA) – a process to evaluate and grant credit equivalency to a worker for his or her prior formal education, training, and work and life experience;
- General Education Development (GED) – a high school equivalency training program;
- short-term skills development; and
- assistance with training referrals.

An evaluation of the CSTEC approach found that the re-employment levels of CSTEC-assisted workers in the primary metals industry were better than those for non-CSTEC-assisted workers. Those who were helped by the CSTEC were also more likely than the others to be re-employed in full-time jobs and had moderately higher wages in their new jobs. There was a much higher level of client satisfaction with the CSTEC process than with available alternatives.³¹ While the outcomes appear favourable for the workers involved with the CSTEC approach, the cost can be significantly higher than other approaches.

Several lessons can be drawn from these mixed results regarding training measures:

- To be effective, training must correspond to the occupations and skills for which demand is increasing or expected to increase. (Understanding demand relies on a

²⁹ Dar and Tzannatos (1999).

³⁰ Rostum (2001).

³¹ Lauzon (1995).

well-functioning labour market information system, by which data is collected frequently from employers and distributed to policy makers, vocational educational institutions, public employment services that administer training programs, workers' and employers' representatives, and individual job seekers. In the absence of this information, training programs can deteriorate into holding patterns – temporary placements for laid-off workers that ultimately lead to unemployment rather than to new jobs.)³²

- On-the-job training is generally more successful than classroom training.
- Short-term training is generally more beneficial than long-term classroom training, but long-term classroom training is required for the intensive skills retraining associated with making a significant change in occupation.

Worker Profiling

One trend in several countries is toward making transition programs more cost effective. One way this is done is to target those individuals who are most at risk of long-term unemployment. The U.S. Worker Profiling and Re-employment Services system profiles UI claimants to determine the probability of them using up all their benefits and then provides mandatory employment and training services to those claimants. Hasluck (2004) estimated that the profiling program reduces the duration of unemployment.

This approach has been echoed in other recent-layoff-to-work transition programs and mass layoff services, which provide more intensive services for those who are deemed to be at higher risk of unemployment, particularly long-term unemployment.

³² Evans-Klock et al. (1998).

2.4 Promising Practices

There is no one best model for transition programs. Every situation will be unique. For large-scale layoffs, most examples of effective measures were based on co-ordinated efforts among official agencies, employers, workers, and communities. Successful models to speed up re-employment included the following:³³

- advance notice to government authorities
- outplacement committee with labour, company, and community members
- rapid response capability by local government agencies
- income maintenance and social services provision
- job search assistance
- social support networks
- job skill training
- community and regional industrial development.

One of the factors in the success of the CSTECH Worker Adjustment Program, discussed above, was the fact that it was an industry-wide initiative. Rostum (2001) argues that an industry-wide approach ensures that stakeholders “buy in” to the program and that those most affected by it have control over the process. The program has enabled local adjustment committees to access targeted training and other quality services at a lower cost through economies of scale. The key lessons learned from the CSTECH experience are:

- most of the benefits gained from the Worker Adjustment Program resulted from an approach that emphasized the importance of peer counselling and targeting of services;
- it is important to focus on job placement initiatives, such as the Job-Finding Club and the National Job Bank and database of clients and employers;
- the formation and training of local adjustment committees has distinct advantages; and
- despite the success of the industry-based approach of CSTECH, the steel sector still sees adjustment as a government responsibility and is only likely to contribute resources if they are based on cost-sharing agreements.³⁴

The three most important elements of effective retraining programs are:

- they should provide workers with marketable skills, based on an understanding of the dynamics of local labour markets;

³³ Ibid.

³⁴ Rostum (2001).

- they should provide enough income support so that workers can afford to participate; and
- the type of training – i.e., long-term classroom versus short-term practical courses – should fit the abilities of workers and the needs of potential employers. In areas with very high unemployment and concentration in declining industries, measures to promote mobility to areas with greater opportunity and measures to bring in new investment and jobs may be more effective than offering training to displaced workers.³⁵

A very broad generalization on the effectiveness of labour transition programs leads to the conclusion that, with the exception of job search assistance, they are unlikely to be both effective (in terms of the goal of moving displaced workers into well-paying, permanent jobs) and cost effective. However, the impact and cost-effectiveness of most active labour market programs depends not only on their design but also on the overall macro and labour market framework.

Job search assistance has a positive impact and is usually cost effective, relative to other active measures. Programs that have yielded positive results have generally been implemented under favourable macroeconomic conditions.

Retraining for those laid off en masse usually has little positive impact. It is more expensive and no more effective than job search assistance. (Job search assistance, however, may not be a direct substitute for retraining, as the target groups may be somewhat different.) Among the various training approaches, the best results are found with demand-led training and on-the-job training, rather than classroom training. Also, skills upgrade training tends to pay larger returns than training for new positions, since the skills gap is less severe and it is thus more cost effective. Classroom training is typically needed when a change in occupation is required, but even here, a combination of classroom and on-the-job training could prove more cost effective than classroom training alone.

Micro-enterprise development programs are usually taken up by only a small fraction of the unemployed. They are associated with high deadweight and displacement effects. The failure rate of businesses started in this way is quite high. As is the case with training for the long-term unemployed, assistance targeted at particular groups seems to have a greater likelihood of success.

Public works programs can help the more disadvantaged groups (e.g., older workers, the long-term unemployed, those in distressed regions) by serving as a safety net. They can also provide stop-gap employment for those in mass layoff situations. They are, however, ineffective instruments as an escape route from permanent unemployment. In comparison to non-participants, program participants are less likely to be employed in an unsubsidized job and earn lower wages.

³⁵ Evans-Klock et al. (1998)

Wage subsidy programs are unlikely to have a positive impact and are quite cost inefficient. The wage and employment outcomes of participants are generally negative in comparison to non-participants. Careful targeting can reduce, but not eliminate, cost inefficiencies. Further controls may be necessary to ensure that firms do not misuse these programs as a permanent subsidy program. As a result, this type of program is best used sparingly for work-to-work transitions among those deemed to be at extreme risk of long-term unemployment.

3. Next Steps

The findings presented above suggest two broad directions for the ESC to pursue: (1) to work in partnership with other stakeholders on effective labour market transition programs (e.g., outplacement and rapid response teams, job search assistance, selective training programs) aimed at workers in target industries, and (2) to further refine the existing data in order to better understand who to target and how. These two directions are elaborated below.

Developing Partnerships

The most cost-effective way to enhance labour market transitions is to become integrated into existing programs and make use of available resources. This could be achieved by:

- partnering with key participants who facilitate labour market transitions and ensuring that information on the electricity industry is delivered to the labour market;
- partnering with key participants in the training and education system and helping to support and develop successful initiatives;
- linking with government authorities in regions where mass layoffs are occurring and industrial adjustment specialists or teams are in place; and
- working with economic development officers in areas where there is strong labour demand, since these individuals are often well informed about various aspects of the labour market.

The third point in particular is worth elaborating on. Mass layoff situations are perhaps the single best source of new skilled labour, since they provide a large number of workers with readily identifiable skills. Where programs exist to help workers in mass layoff situations, industrial adjustment specialists are the lynchpin of the system – they help to ensure that employment services are delivered to the displaced workers. The electricity sector can work with these specialists to provide information about the strong demand in the industry to re-employment assistance committees. Since these committees are formed and employment services provided before the layoff occurs, the most mobile and highly skilled workers will still be at the work site and seeking employment in the early stages of the process. It is therefore essential to act early in the process, before these highly valued workers leave for greener pastures.

The electricity industry can also provide information to job search assistance services, including:

Employment services. These provide information about job openings to prospective candidates. Clearly, an improvement in the flow of information about the excess demand situation in the electricity sector could translate into more job candidates.

Job placement specialists. If these specialists have ready access to information on available jobs in the electricity industry, as well as the needed skills, competencies, and qualifications for those positions, then they will naturally be better able to place their clients.

Job fairs and seminars. Given the necessary time commitment, it is unlikely that the ESC would have the resources to participate directly in these types of activities. It could, however, provide DVD/CDs, online seminars, and so on that could be used by others at these events. Moreover, information about the job fairs and seminars could be made available to companies in the electricity sector; job fairs or seminars provided at the site of mass layoffs in an industry that has a significant concentration of highly skilled workers needed by the electricity industry would be the most desirable.

Training is a key component of workplace transitions, particularly those that involve a change in occupation. Effective training should be based on the following guidelines:

- It should correspond to the occupations and skills for which demand is increasing or is expected to increase.
- Job seekers should understand the extent of the training that they will need to undergo to become a productive employee in a new job or occupation.
- Information about occupational standards and qualifications, as well as information on the cost and length of the training that is required to reach industry standards, is needed to ensure that prospective workers can assess the costs as well as benefits of their new position.

To deliver effective training, the ESC needs to work with policy makers, vocational educational institutions, public employment services that administer training programs, and workers' and employers' representatives. According to the information from the CSTECH study, partnering with educational institutions is valuable, but also a long and arduous road.

Refining the Data

There are several next steps for the ESC to consider with regard to gathering more (or more specific) information on the potential labour supply:

1. The process used for the supply-side analysis can be repeated for the occupations identified in the demand-side research (e.g., skills transferability matrix, identification of industries with high concentrations of target occupations).
 2. Human resource professionals in the electricity sector can be consulted to help fine tune the filters used to develop the list of target occupations identified through the skills transferability matrix.
 3. Estimates of future employment demand could be utilized to identify industries with excess labour.
 4. The information that feeds the skills gap and knowledge gap indicators could be examined in greater depth in order to have a more complete picture of the training required to facilitate labour market transitions. This would need to be done on a case-by-case basis, with each pairing of key and target occupations examined separately.
 5. There appear to be gaps in the information on the relationship between training and the transition success of those experiencing mass layoffs. Most of the research is dated
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and the success of the CSTECH indicates that a multi-pronged approach might benefit transition candidates more than classroom training on its own. For example, there might be a more encouraging outcome if demand-led, classroom, and on-the-job training are combined. And the greatest success would occur for those with the smallest skills and competencies gaps.



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Appendix A: Occupational Similarity Indexes

In order to identify potential workers for the 15 key occupations identified by the ESC, the educational qualifications of workers were compared across all occupations in the economy. This comparison was accomplished by constructing a detailed matrix. This matrix included the 520 occupations listed in the NOC-S and data for five different levels of schooling (Less than High School or LHS, High School or HS, Trade and Vocational School or T&V, College, and University), as well as 110 major fields of study (MFS) from the census. The occupation by education matrix has a total of 172,600 distinct cells. Of the more than 330 distinct education categories, several can be identified in different key occupations. Table A1 below shows the number of key occupations that different education categories provide more than 5% of the workforce.

Table 2: Education Used In Key Occupations

Education	Number of Key Occupation
Level of Schooling & Major Field of Study	Education >5% of Workers
Less Than High School	30
High School	38
Trade	
Transportation technologies	1
Primary resource industrial processing	5
Mechanical engineering technologies	5
Industrial engineering technologies	2
General and civil engineering technologies	2
Electronic and electrical technologies	4
Building technologies	7
College	
Transportation technologies	1
Public health	1
Primary resource industrial processing	6
Other engineering technologies, n.e.c.	2
Office administration, secretarial and clerical	3
Mechanical engineering technologies	20
Industrial engineering technologies	4
General and civil engineering technologies	8
Forestry	1
Financial management	1
Electronic and electrical technologies	10
Data processing and computer technologies	2
Business and commerce	3
Building technologies	13
Agricultural technology	1
University	
Zoology	1
Resources and environmental engineering	1
Public health	1
Mining, metallurgical and petroleum engineerin	2
Mechanical engineering	3
Geology an related fields	1
Geography	1
General and civil engineering technologies	3
Forestry	1
Financial management	1
Environmental studies	2
Engineering, n.e.c.	4
Electronic and electrical technologies	2
Electrical/electronic engineering	2
Computer science and other applied mathemat	1
Civil engineering	4
Chemistry	1
Business and commerce	4
Biology	4
Biological and chemical engineering	1
Architecture and architectural engineering	1
Agricultural science	2

The construction of the SI follows the approach used by Heijke, Matheeuwsen, and Willems to calculate education clusters.³⁶ They used the similarity or competition index, which provides information about apparent substitution possibilities in the labour market.³⁷ For this report the similarity index is defined as:

$$S_{i,i'} = \frac{\sum_j \left(\frac{p_{i,j}}{\sum_j p_{i,j}} \right) \left(\frac{p_{i',j}}{\sum_j p_{i',j}} \right)}{\sqrt{\sum_j \left(\frac{p_{i,j}}{\sum_j p_{i,j}} \right)^2 \sum_j \left(\frac{p_{i',j}}{\sum_j p_{i',j}} \right)^2}}$$

$S_{i,i'}$ is the similarity index of occupational category i with occupational category i' , and $p_{i,j}$ is the number of workers in occupation i with an educational background j .

As discussed by Heijke et al., the similarity index $S_{i,i'}$ is equal to 0 (no similarity) if the occupations i and i' have no workers with the same education. The index is equal to 1 (perfect similarity) if the educational structure of both occupations is identical in the sense that the relative numbers of workers with each type of education is equal. Obviously, the similarity of an occupation with itself is equal to 1, and the SI is symmetric ($S_{i,i'} = S_{i',i}$). This implies that we can distinguish $I(I - 1)/2$ similarity indexes, which means that using the detailed education and occupation data available for the current project a total of 134,940 SI can be identified.

Top 20 Occupations by Similarity				
NOC: 0912				
NOC-S: A392 Utilities managers				
	Similarity Index	Income	Employment	Relative Transition Rate
A392 Utilities managers	1.000	69007	9300	0.926
A391 Manufacturing managers	0.960	66800	79875	0.968
A016 Senior managers - Goods production, utilities, transportation and construction	0.958	111625	53970	0.808
G121 Technical sales specialists, wholesale trade	0.951	52108	64835	1.421
C162 Engineering inspectors and regulatory officers	0.948	47164	4200	0.617
A015 Senior managers - Trade, broadcasting and other services, n.e.c.	0.947	96745	46195	0.839
J022 Supervisors, electronics manufacturing	0.945	38872	4495	0.787
J012 Supervisors, petroleum, gas and chemical processing and utilities	0.938	61137	10055	0.636
A303 Other business services managers	0.936	59734	13400	0.964
A141 Facility operation and maintenance managers	0.934	47130	48585	1.023
A311 Telecommunication carriers managers	0.925	68609	15345	1.089
A373 Transportation managers	0.922	56896	25565	0.955
A312 Postal and courier services managers	0.921	48073	4535	1.018
B314 Property administrators	0.919	34938	33885	0.721
A361 Other services managers	0.917	36112	26925	1.044
G111 Sales representatives, wholesale trade (non-technical)	0.916	41204	143265	1.339
A114 Other administrative services managers	0.916	56075	31845	0.931
A211 Retail trade managers	0.914	35897	337770	1.038
A113 Purchasing managers	0.913	57763	8820	0.974
J021 Supervisors, motor vehicle assembling	0.912	59497	6375	0.711

³⁶ Heijke et al.

³⁷ Ibid.

Top 20 Occupations by Similarity**NOC: 1241****NOC-S: B211 Secretaries (except legal and medical)**

	Similarity Index	Income	Employment	Relative Transition Rate
B211 Secretaries (except legal and medical)	1.000	23995	259105	0.913
B513 Records management and filing clerks	0.992	22123	25285	1.401
B543 Court clerks	0.985	29490	3005	0.985
B312 Executive assistants	0.984	37412	25370	0.952
B511 General office clerks	0.983	23991	251745	1.226
B541 Administrative clerks	0.981	28676	66115	1.096
B522 Data entry clerks	0.976	20666	51395	1.425
B514 Receptionists and switchboard operators	0.976	17653	115020	1.448
B311 Administrative officers	0.967	35172	146240	0.967
B411 Supervisors, general office and administrative support clerks	0.965	37753	19055	1.030
B532 Payroll clerks	0.954	32209	29050	0.971
B553 Customer service, information and related clerks	0.951	23376	155260	1.599
B111 Bookkeepers	0.947	22978	103075	0.911
B524 Telephone operators	0.945	20626	11200	1.559
B535 Collectors	0.943	29191	15950	1.232
B523 Desktop publishing operators and related occupations	0.942	26043	5420	1.195
B533 Customer service representatives - Financial services	0.942	21473	88780	1.405
B554 Survey interviewers and statistical clerks	0.941	11881	24610	1.520
B213 Medical secretaries	0.940	23321	43275	0.943
B542 Personnel clerks	0.939	33034	8835	1.211

Top 20 Occupations by Similarity**NOC: 1411****NOC-S: B511 General office clerks**

	Similarity Index	Income	Employment	Relative Transition Rate
B511 General office clerks	1.000	23991	251745	1.226
B522 Data entry clerks	0.996	20666	51395	1.425
B514 Receptionists and switchboard operators	0.995	17653	115020	1.448
B541 Administrative clerks	0.994	28676	66115	1.096
B411 Supervisors, general office and administrative support clerks	0.992	37753	19055	1.030
B311 Administrative officers	0.992	35172	146240	0.967
B553 Customer service, information and related clerks	0.990	23376	155260	1.599
B513 Records management and filing clerks	0.987	22123	25285	1.401
B524 Telephone operators	0.984	20626	11200	1.559
B211 Secretaries (except legal and medical)	0.983	23995	259105	0.913
B573 production clerks	0.982	35048	13910	1.213
B554 Survey interviewers and statistical clerks	0.982	11881	24610	1.520
B535 Collectors	0.982	29191	15950	1.232
B532 Payroll clerks	0.981	32209	29050	0.971
B533 Customer service representatives - Financial services	0.980	21473	88780	1.405
B414 Supervisors, mail and message distribution occupations	0.976	34391	8070	0.852
B574 Purchasing and inventory clerks	0.976	26675	36165	1.378
B534 Banking, insurance and other financial clerks	0.975	29099	37000	1.227
B111 Bookkeepers	0.974	22978	103075	0.911
B543 Court clerks	0.974	29490	3005	0.985

Top 20 Occupations by Similarity

NOC: 1431

NOC-S: B531 Accounting and related clerks

	Similarity	Index	Income	Employment	Relative	Transition	Rate
B531 Accounting and related clerks	1.000		26691	169990			1.081
B532 Payroll clerks	0.987		32209	29050			0.971
B412 Supervisors, finance and insurance clerks	0.984		40171	21435			1.019
B535 Collectors	0.981		29191	15950			1.232
B111 Bookkeepers	0.980		22978	103075			0.911
B534 Banking, insurance and other financial clerks	0.980		29099	37000			1.227
B112 Loan officers	0.976		36208	21495			1.125
B411 Supervisors, general office and administrative support clerks	0.966		37753	19055			1.030
B533 Customer service representatives - Financial services	0.966		21473	88780			1.405
B311 Administrative officers	0.964		35172	146240			0.967
B541 Administrative clerks	0.959		28676	66115			1.096
B318 Immigration, employment insurance and revenue officers	0.955		40558	20415			1.073
B522 Data entry clerks	0.952		20666	51395			1.425
B511 General office clerks	0.950		23991	251745			1.226
B553 Customer service, information and related clerks	0.939		23376	155260			1.599
B542 Personnel clerks	0.939		33034	8835			1.211
B413 Supervisors, library, correspondence and related information clerks	0.937		33879	12900			1.202
B114 Insurance underwriters	0.935		39509	11735			1.061
B113 Insurance adjusters and claims examiners	0.934		40731	22245			1.051
B514 Receptionists and switchboard operators	0.933		17653	115020			1.448

Top 20 Occupations by Similarity

NOC: 1453

NOC-S: B553 Customer service, information and related clerks

	Similarity	Index	Income	Employment	Relative	Transition	Rate
B553 Customer service, information and related clerks	1.000		23376	155260			1.599
B524 Telephone operators	0.997		20626	11200			1.559
B573 production clerks	0.994		35048	13910			1.213
G723 Casino occupations	0.993		28405	15945			1.793
B554 Survey interviewers and statistical clerks	0.992		11881	24610			1.520
B414 Supervisors, mail and message distribution occupations	0.992		34391	8070			0.852
B574 Purchasing and inventory clerks	0.991		26675	36165			1.378
B514 Receptionists and switchboard operators	0.991		17653	115020			1.448
B522 Data entry clerks	0.990		20666	51395			1.425
B576 Transportation route and crew schedulers	0.990		39786	3685			1.125
B511 General office clerks	0.990		23991	251745			1.226
B533 Customer service representatives - Financial services	0.989		21473	88780			1.405
B411 Supervisors, general office and administrative support clerks	0.988		37753	19055			1.030
G714 Ticket agents, cargo service representatives and related clerks (except airline)	0.988		25890	4650			1.680
G011 Retail trade supervisors	0.986		26354	58945			1.817
G111 Sales representatives, wholesale trade (non-technical)	0.986		41204	143265			1.339
B561 Mail, postal and related clerks	0.985		25500	37570			1.161
B535 Collectors	0.985		29191	15950			1.232
A312 Postal and courier services managers	0.984		48073	4535			1.018
H737 Air transport ramp attendants	0.984		29930	8815			1.859

Top 20 Occupations by Similarity

NOC: 2132

NOC-S: C032 Mechanical engineers

	Similarity	Index	Income	Employment	Relative	Transition	Rate
C032 Mechanical engineers	1.000		57348	29345			0.696
C046 Aerospace engineers	0.809		60501	5835			0.710
C041 Industrial and manufacturing engineers	0.782		55962	14350			0.711
A121 Engineering managers	0.664		81064	15665			0.967
C132 Mechanical engineering technologists and technicians	0.557		46394	10965			0.853
C045 Petroleum engineers	0.550		82913	5895			0.721
C152 Industrial designers	0.511		40469	9430			0.769
C048 Other professional engineers, n.e.c.	0.499		52955	8005			0.672
C042 Metallurgical and materials engineers	0.396		60453	2230			0.705
H221 Stationary engineers and auxiliary equipment operators	0.351		48591	16450			0.656
C133 Industrial engineering and manufacturing technologists and technicians	0.347		42161	13970			0.810
H415 Aircraft mechanics and aircraft inspectors	0.330		45078	15360			0.813
C144 Aircraft instrument, electrical and avionics mechanics, technicians and inspectors	0.326		46118	8870			0.767
H412 Heavy-duty equipment mechanics	0.301		41177	40345			0.808
H016 Contractors and supervisors, mechanic trades	0.300		47184	16690			1.042
A392 Utilities managers	0.295		69007	9300			0.926
H421 Automotive service technicians, truck mechanics and mechanical repairers	0.295		31536	124260			0.893
J211 Aircraft assemblers and aircraft assembly inspectors	0.295		39517	10290			0.864
H222 Power systems and power station operators	0.286		59361	7075			0.694
H322 Boilermakers	0.283		42019	3470			0.759

Top 20 Occupations by Similarity

NOC: 2133

NOC-S: C033 Electrical and electronics engineers

	Similarity Index	Income	Employment	Relative Transition Rate
C033 Electrical and electronics engineers	1.000	61567	30525	0.697
C047 Computer engineers (except software engineers)	0.872	59965	26770	0.788
C073 Software engineers	0.674	60265	25915	0.883
A121 Engineering managers	0.644	81064	15665	0.967
C048 Other professional engineers, n.e.c.	0.452	52955	8005	0.672
C041 Industrial and manufacturing engineers	0.433	55962	14350	0.711
C141 Electrical and electronics engineering technologists and technicians	0.428	41253	37075	0.844
C046 Aerospace engineers	0.424	60501	5835	0.710
A311 Telecommunication carriers managers	0.352	68609	15345	1.089
C183 Systems testing technicians	0.291	38426	6640	0.899
C045 Petroleum engineers	0.291	82913	5895	0.721
A392 Utilities managers	0.291	69007	9300	0.926
C142 Electronic service technicians (household and business equipment)	0.284	32249	47860	0.868
A122 Computer and information systems managers	0.281	72236	44900	1.126
C042 Metallurgical and materials engineers	0.277	60453	2230	0.705
J022 Supervisors, electronics manufacturing	0.271	38872	4495	0.787
H213 Power system electricians	0.270	54136	4590	1.143
H216 Telecommunications installation and repair workers	0.263	42985	23445	0.826
A353 Commissioned officers, armed forces	0.260	54502	14980	1.424
A123 Architecture and science managers	0.259	71207	5980	0.961

Top 20 Occupations by Similarity

NOC: 2241

NOC-S: C141 Electrical and electronics engineering technologists and technicians

	Similarity Index	Income	Employment	Relative Transition Rate
C141 Electrical and electronics engineering technologists and technicians	1.000	41253	37075	0.844
H213 Power system electricians	0.888	54136	4590	1.143
C142 Electronic service technicians (household and business equipment)	0.884	32249	47860	0.868
H216 Telecommunications installation and repair workers	0.878	42985	23445	0.826
H214 Electrical power line and cable workers	0.877	50336	11100	0.751
H012 Contractors and supervisors, electrical trades and telecommunications occupations	0.831	54612	11695	1.032
H217 Cable television service and maintenance technicians	0.793	37107	5585	0.904
H432 Electric appliance servicers and repairers	0.792	27622	8545	0.715
F124 Broadcast technicians	0.773	39501	2910	1.607
H212 Industrial electricians	0.756	51681	27625	1.192
H215 Telecommunications line and cable workers	0.728	40970	10030	0.892
H211 Electricians (except industrial and power system)	0.704	38249	56340	1.358
H222 Power systems and power station operators	0.682	59361	7075	0.694
A311 Telecommunication carriers managers	0.647	68609	15345	1.089
H433 Electrical mechanics	0.643	37928	6435	0.846
C183 Systems testing technicians	0.591	38426	6640	0.899
F125 Audio and video recording technicians	0.556	30632	8425	1.800
A392 Utilities managers	0.540	69007	9300	0.926
C143 Industrial instrument technicians and mechanics	0.538	53233	11110	0.732
J022 Supervisors, electronics manufacturing	0.513	38872	4495	0.787

Top 20 Occupations by Similarity

NOC: 2243

NOC-S: C143 Industrial instrument technicians and mechanics

	Similarity Index	Income	Employment	Relative Transition Rate
C143 Industrial instrument technicians and mechanics	1.000	53233	11110	0.732
C131 Civil engineering technologists and technicians	0.896	38852	10295	0.846
C153 Drafting technologists and technicians	0.872	36362	29450	0.801
H113 Gas fitters	0.846	39870	4430	1.258
C154 Land survey technologists and technicians	0.818	28559	3595	1.105
C054 Land surveyors	0.800	40411	7450	0.625
H112 Steamfitters, pipefitters and sprinkler system installers	0.790	45810	17730	1.328
C134 Construction estimators	0.756	44901	11640	1.088
C164 Construction inspectors	0.697	39480	8480	0.600
H222 Power systems and power station operators	0.617	59361	7075	0.694
C152 Industrial designers	0.612	40469	9430	0.769
H432 Electric appliance servicers and repairers	0.578	27622	8545	0.715
C133 Industrial engineering and manufacturing technologists and technicians	0.573	42161	13970	0.810
H214 Electrical power line and cable workers	0.562	50336	11100	0.751
H217 Cable television service and maintenance technicians	0.558	37107	5585	0.904
H216 Telecommunications installation and repair workers	0.556	42985	23445	0.826
H213 Power system electricians	0.552	54136	4590	1.143
H532 Waterworks and gas maintenance workers	0.547	40474	4610	0.793
A392 Utilities managers	0.547	69007	9300	0.926
H012 Contractors and supervisors, electrical trades and telecommunications occupations	0.540	54612	11695	1.032

Top 20 Occupations by Similarity				
NOC: 7212				
NOC-S: H012 Contractors and supervisors, electrical trades and telecommunications occupations				
	Similarity Index	Income	Employment	Relative Transition Rate
H012 Contractors and supervisors, electrical trades and telecommunications occupations	1.000	54612	11695	1.032
H213 Power system electricians	0.978	54136	4590	1.143
H211 Electricians (except industrial and power system)	0.967	38249	56340	1.358
H212 Industrial electricians	0.964	51681	27625	1.192
H214 Electrical power line and cable workers	0.887	50336	11100	0.751
H216 Telecommunications installation and repair workers	0.857	42985	23445	0.826
C141 Electrical and electronics engineering technologists and technicians	0.831	41253	37075	0.844
H432 Electric appliance servicers and repairers	0.824	27622	8545	0.715
H217 Cable television service and maintenance technicians	0.821	37107	5585	0.904
H418 Elevator constructors and mechanics	0.817	54788	3230	0.721
C142 Electronic service technicians (household and business equipment)	0.812	32249	47860	0.868
H215 Telecommunications line and cable workers	0.780	40970	10030	0.892
H222 Power systems and power station operators	0.735	59361	7075	0.694
H433 Electrical mechanics	0.714	37928	6435	0.846
H431 Oil and solid fuel heating mechanics	0.701	29936	2760	0.768
F124 Broadcast technicians	0.700	39501	2910	1.607
H014 Contractors and supervisors, metal forming, shaping and erecting trades	0.684	52958	7355	1.081
H323 Structural metal and platework fabricators and fitters	0.682	36009	9755	0.809
H326 Welders and related machine operators	0.673	34946	92430	0.875
H013 Contractors and supervisors, pipefitting trades	0.668	53978	4415	1.030

Top 20 Occupations by Similarity				
NOC: 7243				
NOC-S: H213 Power system electricians				
	Similarity Index	Income	Employment	Relative Transition Rate
H213 Power system electricians	1.000	54136	4590	1.143
H012 Contractors and supervisors, electrical trades and telecommunications occupations	0.978	54612	11695	1.032
H212 Industrial electricians	0.949	51681	27625	1.192
H211 Electricians (except industrial and power system)	0.929	38249	56340	1.358
H214 Electrical power line and cable workers	0.892	50336	11100	0.751
C141 Electrical and electronics engineering technologists and technicians	0.888	41253	37075	0.844
H216 Telecommunications installation and repair workers	0.851	42985	23445	0.826
H432 Electric appliance servicers and repairers	0.818	27622	8545	0.715
C142 Electronic service technicians (household and business equipment)	0.817	32249	47860	0.868
H217 Cable television service and maintenance technicians	0.793	37107	5585	0.904
H418 Elevator constructors and mechanics	0.748	54788	3230	0.721
H215 Telecommunications line and cable workers	0.742	40970	10030	0.892
H433 Electrical mechanics	0.742	37928	6435	0.846
H222 Power systems and power station operators	0.737	59361	7075	0.694
F124 Broadcast technicians	0.708	39501	2910	1.607
A311 Telecommunication carriers managers	0.603	68609	15345	1.089
H431 Oil and solid fuel heating mechanics	0.599	29936	2760	0.768
A392 Utilities managers	0.576	69007	9300	0.926
H014 Contractors and supervisors, metal forming, shaping and erecting trades	0.575	52958	7355	1.081
C134 Construction estimators	0.575	44901	11640	1.088

Top 20 Occupations by Similarity				
NOC: 7244				
NOC-S: H214 Electrical power line and cable workers				
	Similarity Index	Income	Employment	Relative Transition Rate
H214 Electrical power line and cable workers	1.000	50336	11100	0.751
H216 Telecommunications installation and repair workers	0.951	42985	23445	0.826
H432 Electric appliance servicers and repairers	0.928	27622	8545	0.715
H217 Cable television service and maintenance technicians	0.928	37107	5585	0.904
H215 Telecommunications line and cable workers	0.897	40970	10030	0.892
C142 Electronic service technicians (household and business equipment)	0.895	32249	47860	0.868
H213 Power system electricians	0.892	54136	4590	1.143
H012 Contractors and supervisors, electrical trades and telecommunications occupations	0.887	54612	11695	1.032
C141 Electrical and electronics engineering technologists and technicians	0.877	41253	37075	0.844
H222 Power systems and power station operators	0.844	59361	7075	0.694
H433 Electrical mechanics	0.784	37928	6435	0.846
F124 Broadcast technicians	0.775	39501	2910	1.607
H212 Industrial electricians	0.755	51681	27625	1.192
H211 Electricians (except industrial and power system)	0.753	38249	56340	1.358
A311 Telecommunication carriers managers	0.745	68609	15345	1.089
A392 Utilities managers	0.736	69007	9300	0.926
J022 Supervisors, electronics manufacturing	0.728	38872	4495	0.787
C162 Engineering inspectors and regulatory officers	0.724	47164	4200	0.617
J012 Supervisors, petroleum, gas and chemical processing and utilities	0.714	61137	10055	0.636
F125 Audio and video recording technicians	0.711	30632	8425	1.800

Top 20 Occupations by Similarity				
NOC: 7311				
NOC-S: H411 Construction millwrights and industrial mechanics (except textile)				
	Similarity Index	Income	Employment	Relative Transition Rate
H411 Construction millwrights and industrial mechanics (except textile)	1.000	48645	63990	0.704
H311 Machinists and machining and tooling inspectors	0.962	37670	51010	0.836
H312 Tool and die makers	0.955	46527	17030	0.837
H011 Supervisors, machinists and related occupations	0.951	51981	6675	0.644
H321 Sheet metal workers	0.947	35296	17815	0.858
H413 Refrigeration and air conditioning mechanics	0.917	39901	13945	0.858
C161 Non-destructive testers and inspectors	0.840	43671	3740	0.801
H416 Machine fitters	0.777	37925	5185	0.778
H016 Contractors and supervisors, mechanic trades	0.762	47184	16690	1.042
C133 Industrial engineering and manufacturing technologists and technicians	0.746	42161	13970	0.810
J191 Machining tool operators	0.740	34898	15975	0.844
H523 Other trades and related occupations	0.734	31498	7775	0.718
J026 Supervisors, other mechanical and metal products manufacturing	0.705	48389	9045	0.724
J211 Aircraft assemblers and aircraft assembly inspectors	0.704	39517	10290	0.864
H142 Glaziers	0.703	28200	7240	1.416
J112 Petroleum, gas and chemical process operators	0.684	59418	12390	0.787
J122 Foundry workers	0.682	38154	9105	0.893
H417 Textile machinery mechanics and repairers	0.674	30196	2340	0.704
H822 Other trades helpers and labourers	0.654	20995	10995	1.331
H433 Electrical mechanics	0.653	37928	6435	0.846

Top 20 Occupations by Similarity				
NOC: 7351				
NOC-S: H221 Stationary engineers and auxiliary equipment operators				
	Similarity Index	Income	Employment	Relative Transition Rate
H221 Stationary engineers and auxiliary equipment operators	1.000	48591	16450	0.656
H415 Aircraft mechanics and aircraft inspectors	0.984	45078	15360	0.813
H421 Automotive service technicians, truck mechanics and mechanical repairers	0.983	31536	124260	0.893
H412 Heavy-duty equipment mechanics	0.983	41177	40345	0.808
H434 Motorcycle and other related mechanics	0.946	29556	3385	0.891
C144 Aircraft instrument, electrical and avionics mechanics, technicians and inspectors	0.939	46118	8870	0.767
H322 Boilermakers	0.926	42019	3470	0.759
C132 Mechanical engineering technologists and technicians	0.913	46394	10965	0.853
H016 Contractors and supervisors, mechanic trades	0.906	47184	16690	1.042
H435 Other small engine and equipment mechanics	0.897	24607	5460	0.851
H422 Motor vehicle body repairers	0.875	28126	31805	0.858
J211 Aircraft assemblers and aircraft assembly inspectors	0.849	39517	10290	0.864
H433 Electrical mechanics	0.846	37928	6435	0.846
H734 Engine room crew, water transport	0.826	35696	665	1.248
H416 Machine fitters	0.727	37925	5185	0.778
H222 Power systems and power station operators	0.721	59361	7075	0.694
J112 Petroleum, gas and chemical process operators	0.719	59418	12390	0.787
C162 Engineering inspectors and regulatory officers	0.632	47164	4200	0.617
H011 Supervisors, machinists and related occupations	0.611	51981	6675	0.644
J012 Supervisors, petroleum, gas and chemical processing and utilities	0.601	61137	10055	0.636

Top 20 Occupations by Similarity				
NOC: 7352				
NOC-S: H222 Power systems and power station operators				
	Similarity Index	Income	Employment	Relative Transition Rate
H222 Power systems and power station operators	1.000	59361	7075	0.694
C162 Engineering inspectors and regulatory officers	0.926	47164	4200	0.617
H433 Electrical mechanics	0.922	37928	6435	0.846
H215 Telecommunications line and cable workers	0.919	40970	10030	0.892
J211 Aircraft assemblers and aircraft assembly inspectors	0.910	39517	10290	0.864
H217 Cable television service and maintenance technicians	0.904	37107	5585	0.904
J012 Supervisors, petroleum, gas and chemical processing and utilities	0.904	61137	10055	0.636
C133 Industrial engineering and manufacturing technologists and technicians	0.894	42161	13970	0.810
J112 Petroleum, gas and chemical process operators	0.884	59418	12390	0.787
H216 Telecommunications installation and repair workers	0.877	42985	23445	0.826
A392 Utilities managers	0.872	69007	9300	0.926
H416 Machine fitters	0.852	37925	5185	0.778
J022 Supervisors, electronics manufacturing	0.846	38872	4495	0.787
H432 Electric appliance servicers and repairers	0.845	27622	8545	0.715
H214 Electrical power line and cable workers	0.844	50336	11100	0.751
A141 Facility operation and maintenance managers	0.842	47130	48585	1.023
J113 Pulping control operators	0.840	58793	1320	0.694
C144 Aircraft instrument, electrical and avionics mechanics, technicians and inspectors	0.840	46118	8870	0.767
G624 Occupations unique to the armed forces	0.839	36128	39185	2.008
H016 Contractors and supervisors, mechanic trades	0.838	47184	16690	1.042

Appendix B:³⁸ Industries with High Share of Target Occupations

Priority Occupation SI Matches >0.8	A392.0912 Utilities Managers Industries With High Share of Occ. Employment	Occ. Employment Share %	
First			
A392.0912 Utilities Managers	562 Waste management and remediation services	0.135	
	221 Utilities	0.492	
Second			
A391.0911 Manufacturing Managers	331 Primary metal manufacturing	0.030	
	327 Non-metallic mineral product manufacturing	0.032	
	322 Paper manufacturing	0.034	
	323 Printing and related support activities	0.038	
	337 Furniture and related product manufacturing	0.044	
	321 Wood product manufacturing	0.045	
	315 Clothing manufacturing	0.046	
	334 Computer and electronic product manufacturing	0.050	
	339 Miscellaneous manufacturing	0.052	
	325 Chemical manufacturing	0.058	
	326 Plastics and rubber products manufacturing	0.059	
	333 Machinery manufacturing	0.068	
	336 Transportation equipment manufacturing	0.081	
	311 Food manufacturing	0.084	
	332 Fabricated metal product manufacturing	0.084	
	Third		
A016.0016 Senior Managers - Goods ProductionUtilitiesTransportation and Construction	336 Transportation equipment manufacturing	0.032	
	339 Miscellaneous manufacturing	0.034	
	323 Printing and related support activities	0.036	
	334 Computer and electronic product manufacturing	0.040	
	311 Food manufacturing	0.041	
	333 Machinery manufacturing	0.042	
	484 Truck transportation	0.054	
	332 Fabricated metal product manufacturing	0.061	
	511 Publishing industries	0.067	
	231 Prime contracting	0.094	
	232 Trade contracting	0.101	
	Fourth		
G121 Technical sales specialists, wholesale trade	333 Machinery manufacturing	0.046	
	416 Building material and supplies wholesaler-distributors	0.057	
	414 Personal and household goods wholesaler-distributor	0.069	
	325 Chemical manufacturing	0.080	
	541 Professionalscientific and technical services	0.086	
	513 Broadcasting and telecommunications	0.093	
	417 Machineryequipment and supplies wholesaler-distrib	0.225	
Fifth			
C162 Engineering inspectors and regulatory officers	221 Utilities	0.065	
	488 Support activities for transportation	0.082	
	336 Transportation equipment manufacturing	0.111	
	911 Federal government public administration	0.120	
	912 Provincial and territorial public administration	0.126	
	541 Professionalscientific and technical services	0.138	
Sixth			
A015 Senior managers - Trade, broadcasting and other services, n.e.c.	722 Food services and drinking places	0.031	
	713 Amusementgambling and recreation industries	0.033	
	413 Foodbeverage and tobacco wholesaler-distributors	0.039	
	811 Repair and maintenance	0.049	
	419 Wholesale agents and brokers	0.050	
	441 Motor vehicle and parts dealers	0.051	
	416 Building material and supplies wholesaler-distributors	0.055	
	418 Miscellaneous wholesaler-distributors	0.061	
	414 Personal and household goods wholesaler-distributor	0.064	
	561 Administrative and support services	0.082	
	417 Machineryequipment and supplies wholesaler-distrib	0.110	
	Seventh		
	J022 Supervisors, electronics manufacturing	335 Electrical equipmentappliance and component manu	0.109
334 Computer and electronic product manufacturing		0.587	
Eighth			
J012 Supervisors, petroleum, gas and chemical processing and utilities	324 Petroleum and coal products manufacturing	0.061	
	211 Oil and gas extraction	0.079	
	221 Utilities	0.252	
	325 Chemical manufacturing	0.317	
Ninth			
A303 Other business services managers	561 Administrative and support services	0.259	
	541 Professionalscientific and technical services	0.310	
Tenth			
414 Personal and household goods wholesaler-distributors	413 Foodbeverage and tobacco wholesaler-distributors	0.027	
	418 Miscellaneous wholesaler-distributors	0.027	
	611 Educational services	0.032	
	913 Localmunicipal and regional public administration	0.032	
	416 Building material and supplies wholesaler-distributors	0.033	
	417 Machineryequipment and supplies wholesaler-distrib	0.043	
	493 Warehousing and storage	0.051	
	561 Administrative and support services	0.056	
	713 Amusementgambling and recreation industries	0.065	
	531 Real estate	0.086	

³⁸ The table for Occupation 7244 (Electrical Power Line and Cable Workers) was not provided.

Priority Occupation SI Matches >0.8	B211.1241 Secretaries (Except Legal and Medical) Industries With High Share of Occ. Employment	Occ. Employment Share %
First		
B211.1241 Secretaries (Except Legal and Medical)	913 Localmunicipal and regional public administration	0.037
	912 Provincial and territorial public administration	0.048
	813 Religiousgrant-makingcivicand professional and similar organizations	0.057
	621 Ambulatory health care services	0.040
	611 Educational services	0.156
	561 Administrative and support services	0.038
	541 Professionalscientific and technical services	0.075
	232 Trade contracting	0.045
Second		
B513.1413 Records Management and Filing Clerks	912 Provincial and territorial public administration	0.054
	541 Professionalscientific and technical services	0.060
	621 Ambulatory health care services	0.067
	911 Federal government public administration	0.094
	622 Hospitals	0.258
Third		
B543.1443 Court Clerks	913 Localmunicipal and regional public administration	0.088
	911 Federal government public administration	0.120
	912 Provincial and territorial public administration	0.724
Fourth		
B312 Executive assistants	913 Localmunicipal and regional public administration	0.029
	524 Insurance carriers and related activities	0.032
	622 Hospitals	0.032
	513 Broadcasting and telecommunications	0.033
	523 Securitiescommodity contractsand other financial investment and related	0.039
	522 Credit intermediation and related activities	0.040
	611 Educational services	0.054
	813 Religiousgrant-makingcivicand professional and similar organizations	0.059
	912 Provincial and territorial public administration	0.065
	911 Federal government public administration	0.083
	541 Professionalscientific and technical services	0.113
Fifth		
B511 General office clerks	813 Religiousgrant-makingcivicand professional and similar organizations	0.032
	622 Hospitals	0.032
	621 Ambulatory health care services	0.033
	913 Localmunicipal and regional public administration	0.039
	524 Insurance carriers and related activities	0.042
	561 Administrative and support services	0.052
	912 Provincial and territorial public administration	0.058
	611 Educational services	0.066
	911 Federal government public administration	0.076
	541 Professionalscientific and technical services	0.080
Sixth		
B541 Administrative clerks	524 Insurance carriers and related activities	0.034
	561 Administrative and support services	0.037
	522 Credit intermediation and related activities	0.039
	913 Localmunicipal and regional public administration	0.044
	611 Educational services	0.054
	541 Professionalscientific and technical services	0.073
	912 Provincial and territorial public administration	0.082
	911 Federal government public administration	0.096
	622 Hospitals	0.107
Seventh		
B522 Data entry clerks	611 Educational services	0.028
	913 Localmunicipal and regional public administration	0.029
	523 Securitiescommodity contractsand other financial investment and related	0.033
	514 Information services and data processing services	0.042
	912 Provincial and territorial public administration	0.047
	522 Credit intermediation and related activities	0.053
	524 Insurance carriers and related activities	0.054
	561 Administrative and support services	0.069
	541 Professionalscientific and technical services	0.082
	911 Federal government public administration	0.096
Eighth		

Priority Occupation SI Matches >0.8	B511.1411 General Office Clerks Industries With High Share of Occ. Employment	Occ. Employment Share %
First		
B511.1411 General Office Clerks	913 Localmunicipal and regional public administration	0.039
	912 Provincial and territorial public administration	0.058
	911 Federal government public administration	0.076
	813 Religiousgrant-makingcivicand professional and simi	0.032
	622 Hospitals	0.032
	621 Ambulatory health care services	0.033
	611 Educational services	0.066
	561 Administrative and support services	0.052
	541 Professionalscientific and technical services	0.080
	524 Insurance carriers and related activities	0.042
Second		
B522.1422 Data Entry Clerks	524 Insurance carriers and related activities	0.042
	611 Educational services	0.028
	913 Localmunicipal and regional public administration	0.029
	523 Securitiescommodity contractsand other financial inv	0.033
	514 Information services and data processing services	0.042
	912 Provincial and territorial public administration	0.047
	522 Credit intermediation and related activities	0.053
	524 Insurance carriers and related activities	0.054
	561 Administrative and support services	0.069
	541 Professionalscientific and technical services	0.082
	911 Federal government public administration	0.096
Third		
B514.1414 Receptionists and Switchboard Operators	561 Administrative and support services	0.044
	812 Personal and laundry services	0.045
	541 Professionalscientific and technical services	0.083
	622 Hospitals	0.083
	621 Ambulatory health care services	0.202
Fourth		
B541 Administrative clerks	524 Insurance carriers and related activities	0.034
	561 Administrative and support services	0.037
	522 Credit intermediation and related activities	0.039
	913 Localmunicipal and regional public administration	0.044
	611 Educational services	0.054
	541 Professionalscientific and technical services	0.073
	912 Provincial and territorial public administration	0.082
	911 Federal government public administration	0.096
	622 Hospitals	0.107
Fifth		
B411 Supervisors, general office and administrative support clerks	524 Insurance carriers and related activities	0.030
	513 Broadcasting and telecommunications	0.038
	913 Localmunicipal and regional public administration	0.040
	611 Educational services	0.041
	622 Hospitals	0.049
	561 Administrative and support services	0.070
	541 Professionalscientific and technical services	0.086
	912 Provincial and territorial public administration	0.087
	911 Federal government public administration	0.120
Sixth		
B311 Administrative officers	524 Insurance carriers and related activities	0.027
	232 Trade contracting	0.035
	813 Religiousgrant-makingcivicand professional and simi	0.039
	912 Provincial and territorial public administration	0.042
	911 Federal government public administration	0.046
	561 Administrative and support services	0.048
	611 Educational services	0.052
	621 Ambulatory health care services	0.085
	541 Professionalscientific and technical services	0.113
Seventh		
B553 Customer service, information and related clerks	541 Professionalscientific and technical services	0.031
	912 Provincial and territorial public administration	0.032
	524 Insurance carriers and related activities	0.037
	911 Federal government public administration	0.040
	522 Credit intermediation and related activities	0.043
	452 General merchandise stores	0.053
	513 Broadcasting and telecommunications	0.110
	561 Administrative and support services	0.118
Eighth		
B513 Records management and filing clerks	912 Provincial and territorial public administration	0.054
	541 Professionalscientific and technical services	0.060
	621 Ambulatory health care services	0.067
	911 Federal government public administration	0.094
	622 Hospitals	0.258
Ninth		
B524 Telephone operators	561 Administrative and support services	0.191
	513 Broadcasting and telecommunications	0.371
Tenth		
913 Localmunicipal and regional public administration	561 Administrative and support services	0.038
	621 Ambulatory health care services	0.040
	232 Trade contracting	0.045
	912 Provincial and territorial public administration	0.048
	813 Religiousgrant-makingcivicand professional and simi	0.057
	541 Professionalscientific and technical services	0.075
	611 Educational services	0.156

Priority Occupation SI Matches >0.8	B531.1431 Accounting and Related Clerks Industries With High Share of Occ. Employment	Occ. Employment Share %
First		
B531.1431 Accounting and Related Clerks	913 Localmunicipal and regional public administration	0.027
	912 Provincial and territorial public administration	0.026
	911 Federal government public administration	0.036
	611 Educational services	0.028
	561 Administrative and support services	0.035
	541 Professionalscientific and technical services	0.123
	522 Credit intermediation and related activities	0.027
	417 Machineryequipment and supplies wholesaler-distributors	0.028
	232 Trade contracting	0.026
Second		
B532.1432 Payroll Clerks	484 Truck transportation	0.026
	912 Provincial and territorial public administration	0.035
	561 Administrative and support services	0.041
	913 Localmunicipal and regional public administration	0.049
	622 Hospitals	0.053
Third		
B412.1212 SupervisorsFinance and Insurance Clerks	541 Professionalscientific and technical services	0.051
	523 Securitiescommodity contractsand other financial investment and related	0.054
	524 Insurance carriers and related activities	0.129
	522 Credit intermediation and related activities	0.313
Fourth		
B535 Collectors	221 Utilities	0.046
	912 Provincial and territorial public administration	0.065
	513 Broadcasting and telecommunications	0.065
	911 Federal government public administration	0.106
	522 Credit intermediation and related activities	0.171
	561 Administrative and support services	0.222
Fifth		
B111 Bookkeepers	111-112 Farms	0.046
	231 Prime contracting	0.036
	484 Truck transportation	0.039
	811 Repair and maintenance	0.048
	232 Trade contracting	0.063
	541 Professionalscientific and technical services	0.242
Sixth		
B534 Banking, insurance and other financial clerks	523 Securitiescommodity contractsand other financial investment and related	0.098
	524 Insurance carriers and related activities	0.201
	522 Credit intermediation and related activities	0.606
Seventh		
B112 Loan officers	522 Credit intermediation and related activities	0.777
Eighth		
B411 Supervisors, general office and administrative support cl	524 Insurance carriers and related activities	0.030
	513 Broadcasting and telecommunications	0.038
	913 Localmunicipal and regional public administration	0.040
	611 Educational services	0.041
	622 Hospitals	0.049
	561 Administrative and support services	0.070
	541 Professionalscientific and technical services	0.086
	912 Provincial and territorial public administration	0.087
	911 Federal government public administration	0.120
Ninth		
B533 Customer service representatives - Financial services	522 Credit intermediation and related activities	0.886
Tenth		
524 Insurance carriers and related activities	232 Trade contracting	0.035
	813 Religiousgrant-makingcivicand professional and similar organizations	0.039
	912 Provincial and territorial public administration	0.042
	911 Federal government public administration	0.046
	561 Administrative and support services	0.048
	611 Educational services	0.052
	621 Ambulatory health care services	0.085
	541 Professionalscientific and technical services	0.113

Priority Occupation SI Matches >0.8	B553.1453 Customer Service Information and Related Clerks Industries With High Share of Occ. Employment	Occ. Employment Share %	
First			
B553.1453 Customer Service Information and Related Clerks	912 Provincial and territorial public administration	0.032	
	911 Federal government public administration	0.040	
	561 Administrative and support services	0.118	
	541 Professionalscientific and technical services	0.031	
	524 Insurance carriers and related activities	0.037	
	522 Credit intermediation and related activities	0.043	
	513 Broadcasting and telecommunications	0.110	
	452 General merchandise stores	0.053	
Second			
B524.1424 Telephone Operators	561 Administrative and support services	0.191	
	513 Broadcasting and telecommunications	0.371	
Third			
B573.1473 Production Clerks	416 Building material and supplies wholesaler-distributors	0.024	
	513 Broadcasting and telecommunications	0.025	
	337 Furniture and related product manufacturing	0.026	
	333 Machinery manufacturing	0.032	
	331 Primary metal manufacturing	0.033	
	325 Chemical manufacturing	0.036	
	541 Professionalscientific and technical services	0.036	
	311 Food manufacturing	0.036	
	326 Plastics and rubber products manufacturing	0.037	
	323 Printing and related support activities	0.042	
	334 Computer and electronic product manufacturing	0.046	
		332 Fabricated metal product manufacturing	0.054
Fourth			
G723 Casino occupations	713 Amusementgambling and recreation industries	0.945	
Fifth			
B554 Survey interviewers and statistical clerks	541 Professionalscientific and technical services	0.223	
	911 Federal government public administration	0.605	
Sixth			
B414 Supervisors, mail and message distribution occupations	492 Couriers and messengers	0.090	
	491 Postal service	0.721	
Seventh			
B574 Purchasing and inventory clerks	418 Miscellaneous wholesaler-distributors	0.026	
	622 Hospitals	0.027	
	311 Food manufacturing	0.029	
	445 Food and beverage stores	0.033	
	336 Transportation equipment manufacturing	0.034	
	416 Building material and supplies wholesaler-distributors	0.040	
	414 Personal and household goods wholesaler-distributor	0.041	
	413 Foodbeverage and tobacco wholesaler-distributors	0.047	
	417 Machineryequipment and supplies wholesaler-distributors	0.049	
	561 Administrative and support services	0.054	
	452 General merchandise stores	0.055	
Eighth			
B514 Receptionists and switchboard operators	561 Administrative and support services	0.044	
	812 Personal and laundry services	0.045	
	541 Professionalscientific and technical services	0.083	
	622 Hospitals	0.083	
	621 Ambulatory health care services	0.202	
Ninth			
B522 Data entry clerks	611 Educational services	0.028	
	913 Localmunicipal and regional public administration	0.029	
	523 Securitiescommodity contractsand other financial inv	0.033	
	514 Information services and data processing services	0.042	
	912 Provincial and territorial public administration	0.047	
	522 Credit intermediation and related activities	0.053	
	524 Insurance carriers and related activities	0.054	
	561 Administrative and support services	0.069	
	541 Professionalscientific and technical services	0.082	
		911 Federal government public administration	0.096
	Tenth		
482 Rail transportation	541 Professionalscientific and technical services	0.039	
	488 Support activities for transportation	0.068	
	481 Air transportation	0.094	
	484 Truck transportation	0.101	
	485 Transit and ground passenger transportation	0.124	

Priority Occupation SI Matches >0.8	C032.2132 Mechanical Engineers Industries With High Share of Occ. Employment	Occ. Employment Share %
First		
C032.2132 Mechanical Engineers	541 Professionalscientific and technical services	0.263
	336 Transportatation equipment manufacturing	0.141
	333 Machinery manufacturing	0.104
	221 Utilities	0.065
Second		
C046.2146 Aerospace Engineers	541 Professionalscientific and technical services	0.088
	336 Transportatation equipment manufacturing	0.612

Priority Occupation SI Matches >0.8	C033.2133 Electrical and Electronics Engineers Industries With High Share of Occ. Employment	Occ. Employment Share %
First		
C033.2133 Electrical and Electronics Engineers	541 Professionalscientific and technical services	0.261
	513 Broadcasting and telecommunications	0.065
	335 Electrical equipmentappliance and component manufacturing	0.061
	334 Computer and electronic product manufacturing	0.179
	221 Utilities	0.159
Second		
C047.2147 Computer Engineers (Except Software Engineers)	417 Machineryequipment and supplies wholesaler-distributors	0.061
	513 Broadcasting and telecommunications	0.150
	334 Computer and electronic product manufacturing	0.174
	541 Professionalscientific and technical services	0.337

Priority Occupation SI Matches >0.8	C141.2241 Electrical and Electronics Engineering Technologists and Technicians Industries With High Share of Occ. Employment	Occ. Employment Share %
First		
C141.2241 Electrical and Electronics Engineering Technologists and Technicians	911 Federal government public administration	0.040
	811 Repair and maintenance	0.042
	541 Professional scientific and technical services	0.136
	513 Broadcasting and telecommunications	0.090
	417 Machinery equipment and supplies wholesaler-distrib	0.057
	335 Electrical equipment appliance and component manu	0.053
	334 Computer and electronic product manufacturing	0.191
221 Utilities	0.076	
Second		
H213.7243 Power System Electricians	232 Trade contracting	0.101
	221 Utilities	0.724
Third		
C142.2242 Electronic Service Technicians (Household and Business E	334 Computer and electronic product manufacturing	0.038
	611 Educational services	0.049
	232 Trade contracting	0.062
	561 Administrative and support services	0.084
	541 Professional scientific and technical services	0.095
	443 Electronics and appliance stores	0.097
	417 Machinery equipment and supplies wholesaler-distrib	0.146
811 Repair and maintenance	0.161	
Fourth		
H216 Telecommunications installation and repair workers	232 Trade contracting	0.114
	513 Broadcasting and telecommunications	0.636
Fifth		
H214 Electrical power line and cable workers	231 Prime contracting	0.116
	221 Utilities	0.690
Sixth		
H012 Contractors and supervisors, electrical trades and telecommunic	513 Broadcasting and telecommunications	0.119
	221 Utilities	0.162
	232 Trade contracting	0.441

Priority Occupation SI Matches >0.8	C143.2243 Industrial Instrument Technicians and Mechanics Industries With High Share of Occ. Employment	Occ. Employment Share %
First		
C143.2243 Industrial Instrument Technicians and Mechanics	811 Repair and maintenance	0.048
	541 Professional scientific and technical services	0.053
	417 Machinery equipment and supplies wholesaler-distributors	0.041
	334 Computer and electronic product manufacturing	0.050
	333 Machinery manufacturing	0.037
	331 Primary metal manufacturing	0.064
	325 Chemical manufacturing	0.057
	322 Paper manufacturing	0.115
	232 Trade contracting	0.037
	221 Utilities	0.124
	211 Oil and gas extraction	0.047
	Second	
C131.2231 Civil Engineering Technologists and Technicians	913 Local municipal and regional public administration	0.110
	231 Prime contracting	0.166
	541 Professional scientific and technical services	0.417
Third		
C153.2253 Drafting Technologists and Technicians	332 Fabricated metal product manufacturing	0.062
	333 Machinery manufacturing	0.064
	541 Professional scientific and technical services	0.477
Fourth		
H113 Gas fitters	221 Utilities	0.225
	232 Trade contracting	0.405
Fifth		
C154 Land survey technologists and technicians	913 Local municipal and regional public administration	0.076
	231 Prime contracting	0.090
	541 Professional scientific and technical services	0.640
Sixth		
C054 Land surveyors	541 Professional scientific and technical services	0.777

Priority Occupation SI Matches >0.8	H012.7212 Contractors and Supervisors Industries With High Share of Occ. Employment	Electrical Trades and Telecommunications Occupations Occ. Employment Share %
First		
H012.7212 Contractors and Supervisors	513 Broadcasting and telecommunications	0.119
	232 Trade contracting	0.441
	221 Utilities	0.162
Second		
H213.7243 Power System Electricians	232 Trade contracting	0.101
	221 Utilities	0.724
Third		
H211.7241 Electricians (Except Industrial and Power System)	232 Trade contracting	0.683
Fourth		
H212 Industrial electricians	321 Wood product manufacturing	0.048
	212 Mining (except oil and gas)	0.063
	322 Paper manufacturing	0.075
	331 Primary metal manufacturing	0.083
	336 Transportation equipment manufacturing	0.111
	232 Trade contracting	0.208
Fifth		
H214 Electrical power line and cable workers	231 Prime contracting	0.116
	221 Utilities	0.690
Sixth		
H216 Telecommunications installation and repair workers	232 Trade contracting	0.114
	513 Broadcasting and telecommunications	0.636
Seventh		
C141 Electrical and electronics engineering technologists and technicians	911 Federal government public administration	0.040
	811 Repair and maintenance	0.042
	335 Electrical equipment/appliance and component manufacturing	0.053
	417 Machinery/equipment and supplies wholesaler-distributors	0.057
	221 Utilities	0.076
	513 Broadcasting and telecommunications	0.090
	541 Professional/scientific and technical services	0.136
	334 Computer and electronic product manufacturing	0.191
Eighth		
H432 Electric appliance servicers and repairers	452 General merchandise stores	0.063
	443 Electronics and appliance stores	0.108
	811 Repair and maintenance	0.481
Ninth		
H217 Cable television service and maintenance technicians	232 Trade contracting	0.158
	513 Broadcasting and telecommunications	0.641
Tenth		
H418 Elevator constructors and mechanics	232 Trade contracting	0.802

Priority Occupation SI Matches >0.8	H213.7243 Power System Electricians Industries With High Share of Occ. Employment	Occ. Employment Share %
First		
H213.7243 Power System Electricians	232 Trade contracting	0.101
	221 Utilities	0.724
Second		
H012.7212 Contractors and SupervisorsElectrical Trades and	513 Broadcasting and telecommunications	0.119
	221 Utilities	0.162
	232 Trade contracting	0.441
Third		
H212.7242 Industrial Electricians		
	321 Wood product manufacturing	0.048
	212 Mining (except oil and gas)	0.063
	322 Paper manufacturing	0.075
	331 Primary metal manufacturing	0.083
	336 Transportation equipment manufacturing	0.111
	232 Trade contracting	0.208
and Safety		
Fourth		
H211 Electricians (except industrial and power system)	232 Trade contracting	0.683
Fifth		
H214 Electrical power line and cable workers	231 Prime contracting	0.116
	221 Utilities	0.690
Sixth		
C141 Electrical and electronics engineering technologists and	911 Federal government public administration	0.040
	811 Repair and maintenance	0.042
	335 Electrical equipmentappliance and component manufacturing	0.053
	417 Machineryequipment and supplies wholesaler-distributors	0.057
	221 Utilities	0.076
	513 Broadcasting and telecommunications	0.090
	541 Professionalscientific and technical services	0.136
	334 Computer and electronic product manufacturing	0.191
Seventh		
H216 Telecommunications installation and repair workers	232 Trade contracting	0.114
	513 Broadcasting and telecommunications	0.636
Eighth		
H432 Electric appliance servicers and repairers	452 General merchandise stores	0.063
	443 Electronics and appliance stores	0.108
	811 Repair and maintenance	0.481
Ninth		
C142 Electronic service technicians (household and business	334 Computer and electronic product manufacturing	0.038
	611 Educational services	0.049
	232 Trade contracting	0.062
	561 Administrative and support services	0.084
	541 Professionalscientific and technical services	0.095
	443 Electronics and appliance stores	0.097
	417 Machineryequipment and supplies wholesaler-distributors	0.146
	811 Repair and maintenance	0.161

Priority Occupation SI Matches >0.8	H221.7351 Stationary Engineers and Auxiliary Equipment Operators Industries With High Share of Occ. Employment	Occ. Employment Share %
First		
H221.7351 Stationary Engineers and Auxiliary Equipment Operators	622 Hospitals	0.073
	611 Educational services	0.043
	331 Primary metal manufacturing	0.042
	325 Chemical manufacturing	0.038
	322 Paper manufacturing	0.136
	321 Wood product manufacturing	0.048
	311 Food manufacturing	0.067
	221 Utilities	0.085
Second		
H415.7315 Aircraft Mechanics and Aircraft Inspectors	911 Federal government public administration	0.079
	488 Support activities for transportation	0.171
	336 Transportation equipment manufacturing	0.278
	481 Air transportation	0.384
Third		
H421.7321 Automotive Service Technicians and Mechanical Repairers	441 Motor vehicle and parts dealers	0.201
	811 Repair and maintenance	0.504
Fourth		
H412 Heavy-duty equipment mechanics	113 Forestry and logging	0.039
	232 Trade contracting	0.041
	484 Truck transportation	0.042
	231 Prime contracting	0.063
	212 Mining (except oil and gas)	0.069
	811 Repair and maintenance	0.170
	417 Machinery equipment and supplies wholesaler-distributors	0.175
Fifth		
H434 Motorcycle and other related mechanics	417 Machinery equipment and supplies wholesaler-distributors	0.158
	811 Repair and maintenance	0.217
	441 Motor vehicle and parts dealers	0.333
Sixth		
C144 Aircraft instrument, electrical and avionics mechanics, technicians and aircraft mechanics	488 Support activities for transportation	0.103
	911 Federal government public administration	0.134
	481 Air transportation	0.222
	336 Transportation equipment manufacturing	0.376
Seventh		
H322 Boilermakers	811 Repair and maintenance	0.058
	231 Prime contracting	0.062
	813 Religious, grant-making, civic and professional and similar organizations	0.062
	232 Trade contracting	0.197
	332 Fabricated metal product manufacturing	0.264
Eighth		
C132 Mechanical engineering technologists and technicians	332 Fabricated metal product manufacturing	0.037
	221 Utilities	0.041
	611 Educational services	0.041
	232 Trade contracting	0.069
	336 Transportation equipment manufacturing	0.123
	333 Machinery manufacturing	0.132
	541 Professional, scientific and technical services	0.183
Ninth		
H016 Contractors and supervisors, mechanic trades	336 Transportation equipment manufacturing	0.051
	232 Trade contracting	0.110
	441 Motor vehicle and parts dealers	0.113
	811 Repair and maintenance	0.269
Tenth		
444 Building material and garden equipment and supplies dealers	417 Machinery equipment and supplies wholesaler-distributors	0.059
	532 Rental and leasing services	0.081
	441 Motor vehicle and parts dealers	0.118
	713 Amusement, gambling and recreation industries	0.123
	811 Repair and maintenance	0.320

Priority Occupation SI Matches >0.8	H222.7352 Power Systems and Power Station Operators Industries With High Share of Occ. Employment	Occ. Employment Share %
First		
H222.7352 Power Systems and Power Station Operators	221 Utilities	0.808
Second		
C162.2262 Engineering Inspectors and Regulatory Officers	221 Utilities	0.065
	488 Support activities for transportation	0.082
	336 Transportation equipment manufacturing	0.111
	911 Federal government public administration	0.120
	912 Provincial and territorial public administration	0.126
	541 Professionalscientific and technical services	0.138
Third		
H433.7333 Electrical Mechanics	333 Machinery manufacturing	0.035
	336 Transportation equipment manufacturing	0.038
	311 Food manufacturing	0.043
	417 Machineryequipment and supplies wholesaler-distributors	0.043
	334 Computer and electronic product manufacturing	0.045
	232 Trade contracting	0.048
	221 Utilities	0.080
	335 Electrical equipmentappliance and component manufacturing	0.114
	811 Repair and maintenance	0.176
Fourth		
H215 Telecommunications line and cable workers	231 Prime contracting	0.135
	232 Trade contracting	0.163
	513 Broadcasting and telecommunications	0.568
Fifth		
J211 Aircraft assemblers and aircraft assembly inspectors	336 Transportation equipment manufacturing	0.904
Sixth		
H217 Cable television service and maintenance technicians	232 Trade contracting	0.158
	513 Broadcasting and telecommunications	0.641
Seventh		
J012 Supervisors, petroleum, gas and chemical processing and utilities	324 Petroleum and coal products manufacturing	0.061
	211 Oil and gas extraction	0.079
	221 Utilities	0.252
	325 Chemical manufacturing	0.317
Eighth		
C133 Industrial engineering and manufacturing technologists and techn	322 Paper manufacturing	0.048
	334 Computer and electronic product manufacturing	0.049
	326 Plastics and rubber products manufacturing	0.077
	333 Machinery manufacturing	0.096
	332 Fabricated metal product manufacturing	0.097
	541 Professionalscientific and technical services	0.117
	336 Transportation equipment manufacturing	0.125
Ninth		
J112 Petroleum, gas and chemical process operators	213 Support activities for mining and oil and gas extraction	0.098
	324 Petroleum and coal products manufacturing	0.168
	325 Chemical manufacturing	0.196
	211 Oil and gas extraction	0.337
232 Trade contracting	513 Broadcasting and telecommunications	0.636

Priority Occupation SI Matches >0.8	H411.7311 Construction Millwrights and Industrial Mechanics (Except Textile) Industries With High Share of Occ. Employment	Occ. Employment Share %
First		
H411.7311 Construction Millwrights and Industrial Mechanics	321 Wood product manufacturing	0.089
	322 Paper manufacturing	0.089
	331 Primary metal manufacturing	0.080
	336 Transportation equipment manufacturing	0.076
	311 Food manufacturing	0.066
	811 Repair and maintenance	0.049
	332 Fabricated metal product manufacturing	0.047
	326 Plastics and rubber products manufacturing	0.046
	232 Trade contracting	0.046
	212 Mining (except oil and gas)	0.039
	333 Machinery manufacturing	0.037
	221 Utilities	0.035
	417 Machinery equipment and supplies wholesaler-distributors	0.032
	325 Chemical manufacturing	0.030
Second		
H311.7231 Machinists and Machining and Tooling Inspectors	336 Transportation equipment manufacturing	0.171
	333 Machinery manufacturing	0.191
	332 Fabricated metal product manufacturing	0.302
Third		
H312.7232 Tool and Die Makers		
	332 Fabricated metal product manufacturing	0.201
	336 Transportation equipment manufacturing	0.243
	333 Machinery manufacturing	0.349
Fourth		
H011 Supervisors, machinists and related occupations	331 Primary metal manufacturing	0.049
	336 Transportation equipment manufacturing	0.169
	333 Machinery manufacturing	0.175
	332 Fabricated metal product manufacturing	0.277
Fifth		
H321 Sheet metal workers	333 Machinery manufacturing	0.070
	336 Transportation equipment manufacturing	0.071
	332 Fabricated metal product manufacturing	0.187
	232 Trade contracting	0.486
Sixth		
H413 Refrigeration and air conditioning mechanics	811 Repair and maintenance	0.080
	232 Trade contracting	0.587
Seventh		
C161 Non-destructive testers and inspectors	331 Primary metal manufacturing	0.068
	336 Transportation equipment manufacturing	0.070
	541 Professional scientific and technical services	0.396

Appendix C: Industries with Declining Employment

Newfoundland Industries With Employment Decline in 2006 & Greater Decline From Ten Year Peak							
NAICS	Max Emp. 1997-06	Min. Emp. 1997-06	Change 2005 to 2006	%Change 2005 to 2006	Below Peak	%Below Peak	
113-Forestry and Logging	1.3	0.5	-0.1	-14.3	-0.7	-53.8	
114-Fishing Hunting and Trapping	9.2	6.8	-0.6	-6.8	-1.0	-10.9	
221-Electric Power Generation Transmission & Dist.	2.5	1.6	-0.2	-8.3	-0.3	-12.0	
311-Food Manufacturing	9.4	6.6	-0.4	-4.8	-1.5	-16.0	
321-Wood Product Manufacturing	1.1	0.5	-0.2	-28.6	-0.6	-54.5	
322-Paper Manufacturing	2.4	1.4	-0.7	-33.3	-1.0	-41.7	
324-Petroleum and Coal Manufacturing	1.3	0.7	-0.3	-30.0	-0.6	-46.2	
331-Primary Metal Manufacturing	0.1	0.0	0.0	-4.5	0.0	-10.2	
332-Fabricated Metal Product Manufacturing	0.6	0.3	0.0	-7.0	-0.1	-22.5	
333-Machinery Manufacturing	0.1	0.1	0.0	-4.5	0.0	-10.2	
334-Computer and Electronic Manufacturing	0.2	0.1	0.0	-4.5	0.0	-10.2	
335-Electric Equipment appliance Manufacturing	0.1	0.0	0.0	-4.5	0.0	-10.2	
339-Miscellaneous Manufacturing	0.5	0.3	0.0	-4.5	-0.1	-15.6	
411-Farm Product Wholesaler Distr.	0.0	0.0	0.0	-19.1	0.0	-50.2	
412-Petroleum Product Wholesaler Distr.	0.5	0.1	0.0	-19.1	-0.4	-75.6	
415-Motor Vehicle and Parts Wholesaler Distr.	0.3	0.2	0.0	-19.1	-0.2	-50.2	
416-Building Material and Supplies Wholesaler Distr.	0.8	0.3	-0.4	-52.0	-0.5	-58.0	
418-Miscellaneous Wholesaler Distr.	1.2	0.5	-0.1	-10.0	-0.3	-25.0	
419-Wholesale Agents and Brokers	0.4	0.2	0.0	-19.1	-0.2	-50.2	
441-Motor Vehicle and Parts Dealers	3.8	2.3	-0.7	-21.9	-1.3	-34.2	
442-Furniture and Home Furnishings Stores	1.1	0.0	-0.1	-12.5	-0.4	-36.4	
443-Electronics and Appliance Stores	1.0	0.2	-0.3	-50.0	-0.7	-70.0	
446-Health and Personal Care Stores	3.1	2.0	-0.1	-4.2	-0.8	-25.8	
447-Gasoline Stations	2.9	2.3	-0.3	-11.1	-0.5	-17.2	
451-Sporting Goods hoggy book & Music Stores	0.9	0.3	-0.1	-12.5	-0.2	-22.2	
452-General Merchandise Stores	5.4	4.0	-0.6	-11.8	-0.9	-16.7	
481-Air Transportation	1.5	0.0	-0.3	-23.1	-0.5	-33.3	
485-Transit & Ground Passenger Transportation	1.5	0.9	-0.2	-18.2	-0.6	-40.0	
488-Support Activites for Rail Transportation	3.4	1.4	-0.2	-7.7	-1.0	-29.4	
522-Credit Intermediation and Related Activities	3.2	2.2	-0.2	-8.0	-0.9	-28.1	
523-Securities Commodity Activities	0.8	0.1	-0.3	-52.6	-0.5	-64.5	
524-Insurance Carriers and Related Activities	2.2	1.6	-0.3	-15.0	-0.5	-22.7	
531-Real Estate	2.1	1.2	-0.2	-13.3	-0.8	-38.1	
532-Rental and Leasing Services	1.3	0.6	-0.2	-18.2	-0.4	-30.8	
541-Professional Scientific and Technical Services	7.7	5.6	-0.4	-5.6	-1.0	-13.0	
562-Waste Management	0.9	0.2	-0.3	-50.0	-0.6	-66.7	
611-Educational Services	17.3	15.8	-0.2	-1.2	-0.7	-4.0	
622-Hospitals	16.2	12.3	-0.8	-5.4	-2.3	-14.2	
713-Amusement Gambling and Recreation Ind.	2.3	0.8	-0.4	-20.0	-0.7	-30.4	
722-Food Services and Drinking Places	10.3	7.0	-0.6	-5.9	-0.7	-6.8	
812-Personal and Laundry Services	3.2	1.8	-0.5	-17.2	-0.8	-25.0	
9120-Provincial Administration	7.8	5.9	-0.9	-13.2	-1.9	-24.4	

PEI Industries With Employment Decline in 2006 & Greater Decline From Ten Year Peak							
NAICS	Max Emp. 1997-06	Min. Emp. 1997-06	Change 2005 to 2006	%Change 2005 to 2006	Below Peak	%Below Peak	
113-Forestry and Logging	0.8	0.1	-0.1	-40.0	-0.7	-85.0	
311-Food Manufacturing	3.7	2.8	-0.1	-2.9	-0.4	-10.8	
312-Beverage and Tobacco Product Manufacturing	0.2	0.0	0.0	-50.0	-0.2	-81.1	
313-Textile Mills	0.1	0.0	0.0	-50.0	0.0	-66.7	
314-Textile Product Mills	0.1	0.0	0.0	-50.0	0.0	-66.7	
315-Clothing Manufacturing	0.1	0.0	0.0	-50.0	0.0	-66.7	
331-Primary Metal Manufacturing	0.1	0.0	0.0	-30.4	-0.1	-60.9	
334-Computer and Electronic Manufacturing	0.1	0.0	0.0	-30.4	0.0	-60.9	
335-Electric Equipment appliance Manufacturing	0.1	0.0	0.0	-30.4	0.0	-60.9	
413-Food and Beverage and Tobacco Wholesaler Dist	0.5	0.2	-0.2	-50.0	-0.3	-60.0	
448-Clothing and Clothing Accessories	0.8	0.5	-0.2	-28.6	-0.3	-37.5	
488-Support Activites for Rail Transportation	0.7	0.2	-0.3	-50.0	-0.4	-57.1	
511-Publishing Industries	0.4	0.2	-0.1	-33.3	-0.2	-50.0	
621-Ambulatory Health Care Services	1.4	1.0	-0.2	-15.4	-0.3	-21.4	
811-Repair and Maintenance	1.2	0.6	-0.1	-9.1	-0.2	-16.7	
814-Private Households	0.8	0.3	-0.1	-25.0	-0.5	-62.5	
911-Federal Government	3.9	2.7	-0.3	-7.9	-0.4	-10.3	
9120-Provincial Administration	2.7	1.8	-0.2	-8.3	-0.5	-18.5	

Nova Scotia		Industries With Employment Decline in 2006 & Greater Decline From Ten Year Peak					
NAICS	Max Emp. 1997-06	Min. Emp. 1997-06	Change 2005 to 2006	%Change 2005 to 2006	Below Peak	%Below Peak	
111-Crop Production	3.1	1.9	-0.6	-24.0	-1.2		
112-Animal Production	3.9	2.4	-0.6	-20.0	-1.5		
113-Forestry and Logging	2.7	1.5	-1.1	-42.3	-1.2		-44.4
115-Support Activities for Agriculture and Forestry	2.0	0.8	-0.8	-50.0	-1.2		-60.0
221-Electric Power Generation Transmission & Dist.	2.8	1.7	-0.6	-25.0	-1.0		-35.7
311-Food Manufacturing	11.8	9.2	-1.2	-10.8	-1.9		-16.1
312-Beverage and Tobacco Product Manufacturing	1.6	0.5	-0.3	-25.0	-0.7		-43.8
313-Textile Mills	0.6	0.1	-0.3	-60.0	-0.4		-71.4
316-Leather & Allied Product Manufacturing	0.1	0.0	0.0	-60.0	-0.1		-71.4
321-Wood Product Manufacturing	4.6	2.5	-1.5	-37.5	-2.1		-45.7
322-Paper Manufacturing	4.1	2.2	-0.2	-8.3	-1.9		-46.3
333-Machinery Manufacturing	1.0	0.6	-0.1	-11.1	-0.2		-20.0
336-Transportation Equipment Manufacturing	6.1	4.2	-0.8	-15.1	-1.6		-26.2
412-Petroleum Product Wholesaler Distr.	1.0	0.2	-0.5	-58.8	-0.7		-67.1
414-Personal and Household Goods Wholesaler Distr.	1.4	0.5	-0.2	-16.7	-0.4		-28.6
418-Miscellaneous Wholesaler Distr.	2.9	1.4	-0.4	-18.2	-1.1		-37.9
441-Motor Vehicle and Parts Dealers	7.6	5.2	-1.4	-18.9	-1.6		-21.1
443-Electronics and Appliance Stores	2.1	0.8	-0.4	-21.1	-0.6		-28.6
482-Rail Transportation	0.9	0.4	-0.1	-12.5	-0.2		-22.2
484-Truck Transportation	6.3	4.4	-1.2	-21.4	-1.9		-30.2
493-Warehousing and Storage	0.6	0.0	-0.1	-25.0	-0.3		-50.0
512-Motion Picture and Video Industries	1.5	0.6	-0.3	-23.1	-0.5		-33.3
519-Other Information	1.0	0.5	-0.2	-25.0	-0.4		-40.0
522-Credit Intermediation and Related Activities	8.9	6.5	-0.4	-5.8	-2.4		-27.0
531-Real Estate	6.9	4.1	-0.6	-9.7	-1.3		-18.8
541-Professional Scientific and Technical Services	20.3	15.1	-1.8	-8.9	-1.9		-9.4
611-Educational Services	36.0	27.8	-0.6	-1.7	-1.3		-3.6
722-Food Services and Drinking Places	24.8	19.4	-0.5	-2.0	-0.8		-3.2
814-Private Households	5.0	3.3	-0.5	-13.2	-1.7		-34.0

New Brunswick		Industries With Employment Decline in 2006 & Greater Decline From Ten Year Peak					
NAICS	Max Emp. 1997-06	Min. Emp. 1997-06	Change 2005 to 2006	%Change 2005 to 2006	Below Peak	%Below Peak	
112-Animal Production	3.6	2.5	-0.5	-15.2	-0.8		
113-Forestry and Logging	4.1	2.5	-0.2	-6.3	-1.1		-26.8
114-Fishing Hunting and Trapping	3.4	1.5	-1.0	-40.0	-1.9		-55.9
115-Support Activities for Agriculture and Forestry	2.3	1.7	-0.5	-22.7	-0.6		-26.1
212-Mining (except Oil and Gas)	3.3	2.0	-0.4	-16.7	-1.3		-39.4
221-Electric Power Generation Transmission & Dist.	4.7	3.0	-0.2	-6.1	-1.6		-34.0
331-Primary Metal Manufacturing	1.0	0.5	0.0	-7.7	-0.4		-44.6
334-Computer and Electronic Manufacturing	0.8	0.2	0.0	-7.7	-0.6		-80.8
335-Electric Equipment appliance Manufacturing	0.3	0.1	0.0	-7.7	-0.2		-69.2
339-Miscellaneous Manufacturing	2.3	1.0	-0.5	-22.7	-0.6		-26.1
411Farm Product Wholesaler Distr.	0.2	0.0	0.0	-30.0	-0.1		-70.0
412-Petroleum Product Wholesaler Distr.	1.0	0.5	-0.2	-30.0	-0.5		-51.0
413-Food and Beverage and Tobacco Wholesaler Distr.	3.0	1.6	-1.1	-40.7	-1.4		-46.7
414-Personal and Household Goods Wholesaler Distr.	1.0	0.3	-0.1	-12.5	-0.3		-30.0
419-Wholesale Agents and Brokers	0.5	0.0	-0.1	-30.0	-0.4		-70.0
447-Gasoline Stations	3.9	2.8	-0.1	-2.9	-0.6		-15.4
482-Rail Transportation	1.5	0.7	-0.2	-22.2	-0.8		-53.3
488-Support Activites for Rail Transportation	2.7	1.2	-0.5	-21.7	-0.9		-33.3
492-Couriers and Messengers	3.6	2.3	-0.2	-6.5	-0.7		-19.4
512-Motion Picture and Video Industries	0.8	0.0	-0.5	-100.0	-0.8		-100.0
524-Insurance Carriers and Related Activities	4.4	3.3	-0.2	-4.7	-0.3		-6.8
532-Rental and Leasing Services	2.1	0.9	-0.1	-6.3	-0.6		-28.6
541-Professional Scientific and Technical Services	16.1	10.5	-0.6	-4.0	-1.6		-9.9
621-Ambulatory Health Care Services	8.8	5.3	-0.9	-11.0	-1.5		-17.0
623-Nursing & Residential Care Facilities	9.8	7.7	-0.9	-9.4	-1.1		-11.2
624-Social Assistance	11.0	8.3	-0.4	-3.9	-1.1		-10.0
711-Performing Arts Spectator Sports & Related Ind.	1.4	0.9	-0.2	-16.7	-0.4		-28.6
713-Amusement Gambling and Recreation Ind.	4.1	2.3	-0.6	-15.0	-0.7		-17.1
812-Personal and Laundry Services	5.2	3.5	-0.2	-4.4	-0.9		-17.3
911-Federal Government	10.0	7.0	-0.3	-3.1	-0.7		-7.0
9120-Provincial Administration	9.4	7.0	-0.1	-1.3	-2.0		-21.3

Quebec		Industries With Employment Decline in 2006 & Greater Decline From Ten Year Peak					
NAICS	Max Emp. 1997-06	Min. Emp. 1997-06	Change 2005 to 2006	%Change 2005 to 2006	Below Peak	%Below Peak	
113-Forestry and Logging	21.5	13.6	-0.9	-6.2	-7.9	-36.7	
221-Electric Power Generation Transmission & Dist.	32.2	26.8	-2.1	-6.6	-2.5	-7.8	
2362-Non-residential Building Construction	18.6	10.0	-1.0	-8.3	-7.6	-40.9	
311-Food Manufacturing	73.7	50.7	-0.9	-1.4	-8.5	-11.5	
312-Beverage and Tobacco Product Manufacturing	13.2	6.7	-1.8	-21.2	-6.5	-49.2	
313-Textile Mills	12.8	8.2	-0.4	-4.7	-4.6	-35.9	
314-Textile Product Mills	18.6	7.7	-3.5	-31.3	-10.9	-58.6	
315-Clothing Manufacturing	70.5	31.2	-1.0	-3.1	-39.3	-55.7	
316-Leather & Allied Product Manufacturing	6.7	2.1	-2.0	-48.8	-4.6	-68.7	
321-Wood Product Manufacturing	65.6	41.5	-0.9	-1.7	-12.8	-19.5	
323-Printing Manufacturing	39.1	27.5	-5.5	-16.3	-10.8	-27.6	
325-Chemical Manufacturing	39.1	28.8	-1.1	-3.4	-8.0	-20.5	
333-Machinery Manufacturing	33.5	20.1	-0.9	-3.3	-6.9	-20.6	
334-Computer and Electronic Manufacturing	43.0	22.7	-1.4	-5.5	-19.1	-44.4	
339-Miscellaneous Manufacturing	28.8	21.9	-2.4	-9.6	-6.1	-21.2	
411-Farm Product Wholesaler Distr.	2.0	0.4	-0.3	-25.7	-1.0	-51.7	
412-Petroleum Product Wholesaler Distr.	4.3	1.5	-1.1	-40.7	-2.7	-62.8	
417-Machinery Equip and Suplies Wholesaler Distr.	41.2	23.2	-1.6	-5.0	-11.1	-26.9	
419-Wholesale Agents and Brokers	2.8	0.4	-0.6	-25.7	-1.2	-41.6	
443-Electronics and Appliance Stores	15.9	9.2	-2.2	-14.7	-3.1	-19.5	
445-Food and Beverages Stores	129.1	100.4	-5.6	-4.4	-7.3	-5.7	
452-General Merchandise Stores	60.3	45.2	-3.8	-6.3	-3.9	-6.5	
453-Miscellaneous Stores Retailers	30.7	20.5	-4.6	-17.9	-9.6	-31.3	
484-Truck Transportation	63.4	48.6	-0.2	-0.3	-4.0	-6.3	
493-Warehousing and Storage	4.1	2.0	-0.3	-8.8	-1.0	-24.4	
511-Publishing Industries	21.7	12.9	-0.6	-3.4	-4.6	-21.2	
515-Broadcasting (except Internet)	14.7	8.8	-5.1	-36.7	-5.9	-40.1	
623-Nursing & Residential Care Facilities	70.9	59.6	-3.6	-5.4	-8.1	-11.4	
713-Amusement Gambling and Recreation Ind.	44.9	26.5	-1.0	-2.4	-4.7	-10.5	
811-Repair and Maintenance	70.7	60.8	-5.9	-8.8	-9.9	-14.0	
812-Personal and Laundry Services	54.8	41.2	-0.3	-0.6	-6.6	-12.0	

Ontario		Industries With Employment Decline in 2006 & Greater Decline From Ten Year Peak					
NAICS	Max Emp. 1997-06	Min. Emp. 1997-06	Change 2005 to 2006	%Change 2005 to 2006	Below Peak	%Below Peak	
113-Forestry and Logging	7.9	5.4	-1.4	-18.2	-1.6	-20.3	
221-Electric Power Generation Transmission & Dist.	58.4	46.2	-0.9	-1.8	-9.4	-16.1	
237-Heavy and Civil Engineering Construction	36.2	28.0	-1.6	-4.9	-5.0	-13.8	
312-Beverage and Tobacco Product Manufacturing	16.5	12.6	-1.3	-8.5	-2.5	-15.2	
315-Clothing Manufacturing	32.8	22.5	-2.9	-11.4	-10.3	-31.4	
316-Leather & Allied Product Manufacturing	6.5	1.1	-0.9	-30.0	-4.4	-67.7	
322-Paper Manufacturing	42.3	30.4	-3.9	-11.4	-11.9	-28.1	
323-Printing Manufacturing	51.5	39.3	-4.0	-8.9	-10.6	-20.6	
325-Chemical Manufacturing	65.1	51.0	-11.5	-18.4	-14.1	-21.7	
326-Plastics and Rubber Manufacturing	79.0	56.0	-7.7	-10.1	-10.2	-12.9	
332-Fabricated Metal Product Manufacturing	96.6	75.5	-3.6	-3.7	-3.8	-3.9	
333-Machinery Manufacturing	72.7	51.4	-6.4	-9.5	-12.0	-16.5	
335-Electric Equipment appliance Manufacturing	36.8	23.0	-2.8	-10.9	-13.8	-37.5	
336-Transportation Equipment Manufacturing	232.3	184.1	-9.2	-4.1	-15.6	-6.7	
337-Furniture and Related Manufacturing	60.3	30.1	-7.1	-14.5	-18.5	-30.7	
416-Building Material and Supplies Wholesaler Distr.	37.5	20.3	-3.0	-8.4	-4.6	-12.3	
418-Miscellaneous Wholesaler Distr.	41.1	29.8	-0.7	-1.7	-1.5	-3.6	
442-Furniture and Home Furnishings Stores	30.4	20.3	-2.5	-8.7	-4.3	-14.1	
446-Health and Personal Care Stores	55.0	39.4	-0.6	-1.1	-1.5	-2.7	
447-Gasoline Stations	24.9	19.1	-4.5	-19.1	-5.8	-23.3	
451-Sporting Goods hoggy book & Music Stores	37.1	25.5	-0.5	-1.5	-5.0	-13.5	
453-Miscellaneous Stores Retailers	62.2	51.0	-4.5	-8.1	-11.2	-18.0	
454-Non-Store Retailers	24.0	17.1	-0.9	-4.9	-6.6	-27.5	
481-Air Transportation	20.6	16.9	-2.1	-10.9	-3.4	-16.5	
483-Water transportation	3.9	0.7	-0.1	-9.1	-3.1	-80.3	
486-Pipeline Transportation	1.0	0.5	-0.1	-9.1	-0.4	-41.4	
487-Scenic and Sightseeing Transportation	1.8	0.6	-0.1	-9.1	-1.1	-63.7	
491-Postal Service	35.4	22.4	-1.1	-3.6	-6.0	-16.9	
532-Rental and Leasing Services	28.6	24.2	-0.3	-1.2	-4.0	-14.0	
713-Amusement Gambling and Recreation Ind.	90.4	50.2	-1.8	-2.1	-5.9	-6.5	
721-Accommodation Services	66.7	50.2	-1.1	-1.7	-1.7	-2.5	
811-Repair and Maintenance	95.3	87.7	-2.9	-3.2	-6.5	-6.8	
814-Private Households	34.9	23.5	-0.4	-1.7	-11.4	-32.7	
911-Federal Government	145.6	103.2	-12.1	-8.7	-18.5	-12.7	
9130-Municipal Administration	118.5	97.0	-3.2	-2.8	-6.6	-5.6	

Saskatchewan Industries With Employment Decline in 2006 & Greater Decline From Ten Year Peak							
NAICS	Max Emp. 1997-06	Min. Emp. 1997-06	Change 2005 to 2006	%Change 2005 to 2006	Below Peak	%Below Peak	
111-Crop Production	19.2	10.2	-0.2	-1.7	-7.7		
113-Forestry and Logging	1.1	0.5	-0.3	-38.5	-0.6	-54.5	
114-Fishing Hunting and Trapping	4.7	0.5	-2.7	-77.1	-3.9	-83.0	
212-Mining (except Oil and Gas)	6.5	2.4	-0.3	-9.4	-3.6	-55.4	
221-Electric Power Generation Transmission & Dist.	7.0	4.8	-1.3	-18.8	-1.4	-20.0	
2362-Non-residential Building Construction	2.9	1.6	-0.3	-15.8	-1.3	-44.8	
313-Textile Mills	0.5	0.1	-0.1	-37.5	-0.3	-66.7	
315-Clothing Manufacturing	5.6	2.5	-0.7	-21.9	-3.1	-55.4	
316-Leather & Allied Product Manufacturing	0.6	0.2	-0.2	-37.5	-0.3	-44.4	
321-Wood Product Manufacturing	5.7	2.8	-0.1	-2.3	-1.4	-24.6	
324-Petroleum and Coal Manufacturing	0.4	0.0	-0.1	-100.0	-0.4	-100.0	
334-Computer and Electronic Manufacturing	2.2	1.1	-0.3	-21.4	-1.1	-50.0	
336-Transportation Equipment Manufacturing	10.8	8.0	-0.7	-8.0	-2.8	-25.9	
412-Petroleum Product Wholesaler Distr.	0.8	0.2	-0.1	-33.3	-0.6	-69.2	
414-Personal and Household Goods Wholesaler Distr.	2.4	1.1	-0.1	-6.3	-0.9	-37.5	
415-Motor Vehicle and Parts Wholesaler Distr.	2.1	1.4	-0.2	-11.1	-0.5	-23.8	
419-Wholesale Agents and Brokers	0.6	0.1	-0.1	-33.3	-0.4	-74.4	
482-Rail Transportation	6.7	4.7	-0.3	-6.0	-2.0	-29.9	
485-Transit & Ground Passenger Transportation	3.7	2.1	-0.4	-11.1	-0.5	-13.5	
492-Couriers and Messengers	2.8	2.1	-0.4	-16.0	-0.7	-25.0	
517-Telecommunications	5.9	4.8	-0.2	-3.6	-0.6	-10.2	
532-Rental and Leasing Services	2.9	1.3	-0.9	-37.5	-1.4	-48.3	
561-Administrative and Support Services	19.6	13.5	-1.6	-8.5	-2.3	-11.7	
712-Heritage Institutions	1.3	0.7	-0.2	-18.2	-0.4	-30.8	
9130-Municipal Administration	12.6	8.0	-0.9	-10.1	-4.6	-36.5	

Saskatchewan Industries With Employment Decline in 2006 & Greater Decline From Ten Year Peak							
NAICS	Max Emp. 1997-06	Min. Emp. 1997-06	Change 2005 to 2006	%Change 2005 to 2006	Below Peak	%Below Peak	
114-Fishing Hunting and Trapping	14.4	4.1	-0.6	-11.5	-9.8	-68.1	
311-Food Manufacturing	6.6	5.7	-0.2	-3.3	-0.7	-10.6	
314-Textile Product Mills	0.5	0.2	-0.2	-46.5	-0.3	-57.4	
315-Clothing Manufacturing	0.7	0.3	-0.2	-43.9	-0.4	-59.9	
322-Paper Manufacturing	1.7	0.5	-0.5	-50.0	-1.2	-70.6	
323-Printing Manufacturing	1.8	1.0	-0.1	-9.1	-0.8	-44.4	
324-Petroleum and Coal Manufacturing	1.6	0.6	-0.7	-50.0	-0.9	-56.3	
411Farm Product Wholesaler Distr.	2.1	0.7	-0.3	-25.0	-1.2	-57.1	
418-Miscellaneous Wholesaler Distr.	4.1	3.0	-0.3	-8.3	-0.8	-19.5	
419-Wholesale Agents and Brokers	0.4	0.0	-0.2	-100.0	-0.4	-100.0	
448-Clothing and Clothing Accessories	4.6	3.1	-0.1	-2.2	-0.2	-4.3	
454-Non-Store Retailers	2.6	1.9	-0.3	-13.6	-0.7	-26.9	
482-Rail Transportation	3.4	1.9	-0.1	-5.0	-1.5	-44.1	
484-Truck Transportation	12.0	8.2	-0.8	-7.2	-1.7	-14.2	
517-Telecommunications	6.1	4.9	-0.6	-10.5	-1.0	-16.4	
522-Credit Intermediation and Related Activities	11.7	9.9	-0.4	-3.8	-1.6	-13.7	
524-Insurance Carriers and Related Activities	7.2	6.1	-0.7	-10.3	-1.1	-15.3	
611-Educational Services	40.4	32.1	-0.7	-1.8	-2.3	-5.7	
624-Social Assistance	13.3	9.9	-1.8	-15.4	-3.4	-25.6	
711-Performing Arts Spectator Sports & Related Ind.	2.4	1.4	-0.1	-5.0	-0.5	-20.8	
721-Accommodation Services	9.1	7.0	-0.5	-6.5	-1.9	-20.9	
811-Repair and Maintenance	10.4	8.1	-1.2	-12.9	-2.3	-22.1	
813-Religious Grant-Making civic & Prof & Similar Org	6.5	5.2	-0.1	-1.6	-0.3	-4.6	
9130-Municipal Administration	10.3	6.9	-0.2	-2.5	-2.5	-24.3	

Alberta		Industries With Employment Decline in 2006 & Greater Decline From Ten Year Peak					
NAICS	Max Emp. 1997-06	Min. Emp. 1997-06	Change 2005 to 2006	%Change 2005 to 2006	Below Peak	%Below Peak	
111-Crop Production	27.3	14.0	-3.2	-18.6	-13.3		
112-Animal Production	42.7	27.2	-1.8	-6.2	-15.5		
113-Forestry and Logging	3.7	1.9	-0.1	-5.0	-1.8		-48.6
115-Support Activities for Agriculture and Forestry	5.2	2.6	-0.4	-10.5	-1.8		-34.6
212-Mining (except Oil and Gas)	6.6	3.1	-1.0	-23.3	-3.3		-50.0
2362-Non-residential Building Construction	13.8	7.0	-2.0	-16.1	-3.4		-24.6
313-Textile Mills	0.5	0.2	-0.1	-43.8	-0.3		-65.4
314-Textile Product Mills	1.9	0.4	-0.3	-43.8	-1.5		-78.0
315-Clothing Manufacturing	3.7	1.0	-0.8	-43.8	-2.7		-73.8
316-Leather & Allied Product Manufacturing	0.7	0.2	-0.2	-43.8	-0.4		-65.4
324-Petroleum and Coal Manufacturing	6.8	3.0	-1.8	-36.7	-3.7		-54.4
327-Non-Metallic Mineral Manufacturing	6.0	3.9	-0.5	-8.5	-0.6		-10.0
336-Transportation Equipment Manufacturing	7.0	3.8	-0.1	-2.2	-2.6		-37.1
337-Furniture and Related Manufacturing	11.2	6.3	-0.3	-4.5	-4.9		-43.8
411Farm Product Wholesaler Distr.	1.7	0.6	-0.3	-31.2	-1.0		-56.0
416-Building Material and Supplies Wholesaler Distr.	11.1	6.0	-0.8	-7.3	-0.9		-8.1
419-Wholesale Agents and Brokers	1.5	0.4	-0.2	-31.2	-1.1		-76.5
442-Furniture and Home Furnishings Stores	12.9	5.5	-0.1	-0.9	-2.0		-15.5
446-Health and Personal Care Stores	14.8	9.1	-0.7	-5.5	-2.8		-18.9
453-Miscellaneous Stores Retailers	17.6	11.3	-2.9	-20.4	-6.3		-35.8
486-Pipeline Transportation	4.3	2.3	-0.9	-28.1	-2.0		-46.5
488-Support Activities for Rail Transportation	9.6	3.4	-0.8	-9.1	-1.6		-16.7
492-Couriers and Messengers	8.9	5.2	-0.9	-11.4	-1.9		-21.3
493-Warehousing and Storage	8.4	3.8	-1.0	-14.7	-2.6		-31.0
511-Publishing Industries	8.9	6.0	-1.2	-16.7	-2.9		-32.6
512-Motion Picture and Video Industries	5.6	1.9	-0.7	-20.6	-2.9		-51.8
515-Broadcasting (except Internet)	5.1	3.1	-1.8	-36.0	-1.9		-37.3
516-Internet Publishing and Broadcasting	0.1	0.0	-0.1	-100.0	-0.1		-100.0
523-Securities Commodity Activities	10.5	6.5	-2.3	-24.0	-3.2		-30.5
532-Rental and Leasing Services	10.3	7.5	-0.1	-1.0	-0.8		-7.8
561-Administrative and Support Services	60.2	42.7	-0.2	-0.3	-1.8		-3.0
623-Nursing & Residential Care Facilities	29.7	18.8	-2.4	-9.5	-6.8		-22.9
624-Social Assistance	39.3	33.8	-0.2	-0.5	-1.5		-3.8
711-Performing Arts Spectator Sports & Related Ind.	11.8	7.8	-1.8	-15.8	-2.2		-18.6
713-Amusement Gambling and Recreation Ind.	23.4	12.7	-0.9	-3.9	-1.0		-4.3
814-Private Households	10.7	5.3	-1.4	-20.9	-5.4		-50.5

British Columbia		Industries With Employment Decline in 2006 & Greater Decline From Ten Year Peak					
NAICS	Max Emp. 1997-06	Min. Emp. 1997-06	Change 2005 to 2006	%Change 2005 to 2006	Below Peak	%Below Peak	
111-Crop Production	21.2	11.1	-1.3	-6.6	-2.7		
112-Animal Production	15.8	10.6	-2.4	-16.7	-3.8		
113-Forestry and Logging	21.8	13.6	-0.7	-4.9	-8.2		-37.6
221-Electric Power Generation Transmission & Dist.	11.3	8.6	-1.7	-16.5	-2.7		-23.9
2362-Non-residential Building Construction	11.0	6.9	-2.9	-27.6	-3.4		-30.9
311-Food Manufacturing	27.3	18.2	-6.9	-26.1	-7.8		-28.6
312-Beverage and Tobacco Product Manufacturing	5.8	3.0	-0.2	-3.9	-0.9		-15.5
313-Textile Mills	0.8	0.0	-0.4	-63.3	-0.5		-68.1
314-Textile Product Mills	2.7	0.7	-1.2	-63.3	-2.0		-74.6
316-Leather & Allied Product Manufacturing	1.5	0.0	-0.3	-63.3	-1.3		-88.8
321-Wood Product Manufacturing	49.0	42.4	-1.0	-2.2	-4.2		-8.6
325-Chemical Manufacturing	8.5	3.9	-0.4	-6.3	-2.5		-29.4
411Farm Product Wholesaler Distr.	2.0	0.5	-0.1	-6.9	-1.2		-59.7
412-Petroleum Product Wholesaler Distr.	1.7	0.4	-0.1	-6.9	-1.0		-57.3
413-Food and Beverage and Tobacco Wholesaler Distr.	15.5	10.9	-0.3	-2.2	-2.3		-14.8
414-Personal and Household Goods Wholesaler Distr.	10.4	7.4	-0.4	-4.1	-1.1		-10.6
418-Miscellaneous Wholesaler Distr.	16.1	10.4	-1.6	-10.3	-2.2		-13.7
419-Wholesale Agents and Brokers	1.8	0.7	-0.1	-6.9	-0.7		-36.1
451-Sporting Goods hobby book & Music Stores	14.8	12.1	-1.1	-7.7	-1.6		-10.8
452-General Merchandise Stores	30.2	25.7	-1.6	-5.6	-3.0		-9.9
454-Non-Store Retailers	9.4	6.1	-0.5	-6.3	-1.9		-20.2
481-Air Transportation	19.8	11.9	-0.6	-4.5	-7.0		-35.4
482-Rail Transportation	9.7	4.4	-1.8	-29.0	-5.3		-54.6
517-Telecommunications	26.7	17.1	-0.8	-4.3	-9.1		-34.1
518-Internet Service Providers, Web Search Portals &	4.3	1.2	-0.1	-3.0	-1.1		-25.6
711-Performing Arts Spectator Sports & Related Ind.	21.8	12.8	-0.2	-1.0	-2.4		-11.0
712-Heritage Institutions	4.0	1.6	-1.2	-34.3	-1.7		-42.5
721-Accommodation Services	44.3	31.7	-4.0	-10.3	-9.3		-21.0
814-Private Households	18.1	9.0	-1.6	-15.1	-9.1		-50.3
9120-Provincial Administration	32.7	26.8	-3.1	-10.4	-5.9		-18.0
9130-Municipal Administration	33.7	25.1	-2.8	-8.9	-5.2		-15.4

Appendix D: Industries with Falling Employment and More than Ten Target Occupations³⁹

Industries With Declining Employment and More Than Ten Target Occupations

221 Utilities

NOC Categories

A392 Utilities managers
B531 Accounting and related clerks
C032 Mechanical engineers
C033 Electrical and electronics engineers
C054 Land surveyors
C131 Civil engineering technologists and technicians
C133 Industrial engineering and manufacturing technologists and technicians
C141 Electrical and electronics engineering technologists and technicians
C143 Industrial instrument technicians and mechanics
C163 Inspectors in public and environmental health and occupational health and safety
H012 Contractors and supervisors, electrical trades and telecommunications occupations
H112 Steamfitters, pipefitters and sprinkler system installers
H212 Industrial electricians
H213 Power system electricians
H214 Electrical power line and cable workers
H221 Stationary engineers and auxiliary equipment operators
H222 Power systems and power station operators
H311 Machinists and machining and tooling inspectors
H411 Construction millwrights and industrial mechanics (except textile)
H412 Heavy-duty equipment mechanics
H611 Heavy equipment operators (except crane)
H622 Drillers and blasters - Surface mining, quarrying and construction
H711 Truck drivers
I122 Supervisors, oil and gas drilling and service
I131 Underground production and development miners
I132 Oil and gas well drillers, servicers, testers and related workers
J112 Petroleum, gas and chemical process operators

³⁹ Due to lack of access to the original data, information specific to the electricity sector could not be presented separately here.

Industries With Declining Employment and More Than Ten Target Occupations**NAICS: 231 Prime contracting****NOC Categories**

A392 Utilities managers
B531 Accounting and related clerks
C031 Civil engineers
C053 Urban and land use planners
C054 Land surveyors
C131 Civil engineering technologists and technicians
C141 Electrical and electronics engineering technologists and technicians
C143 Industrial instrument technicians and mechanics
H012 Contractors and supervisors, electrical trades and telecommunications occupations
H112 Steamfitters, pipefitters and sprinkler system installers
H213 Power system electricians
H214 Electrical power line and cable workers
H221 Stationary engineers and auxiliary equipment operators
H222 Power systems and power station operators
H326 Welders and related machine operators
H412 Heavy-duty equipment mechanics
H611 Heavy equipment operators (except crane)
H622 Drillers and blasters - Surface mining, quarrying and construction
H711 Truck drivers
I122 Supervisors, oil and gas drilling and service
I131 Underground production and development miners
I132 Oil and gas well drillers, servicers, testers and related workers
I142 Oil and gas well drilling workers and services operators

Industries With Declining Employment and More Than Ten Target Occupations**NAICS: 311 Food manufacturing****NOC Categories**

A392 Utilities managers
B553 Customer service, information and related clerks
C023 Agricultural representatives, consultants and specialists
C121 Biological technologists and technicians
C133 Industrial engineering and manufacturing technologists and technicians
C163 Inspectors in public and environmental health and occupational health and safety
H221 Stationary engineers and auxiliary equipment operators
H222 Power systems and power station operators
H311 Machinists and machining and tooling inspectors
H411 Construction millwrights and industrial mechanics (except textile)
H412 Heavy-duty equipment mechanics

Industries With Declining Employment and More Than Ten Target Occupations**NAICS: 321 Wood product manufacturing****NOC Categories**

A392 Utilities managers
C022 Forestry professionals
C133 Industrial engineering and manufacturing technologists and technicians
C163 Inspectors in public and environmental health and occupational health and safety
H012 Contractors and supervisors, electrical trades and telecommunications occupations
H212 Industrial electricians
H213 Power system electricians
H221 Stationary engineers and auxiliary equipment operators
H311 Machinists and machining and tooling inspectors
H411 Construction millwrights and industrial mechanics (except textile)
H412 Heavy-duty equipment mechanics
H611 Heavy equipment operators (except crane)
H622 Drillers and blasters - Surface mining, quarrying and construction
H711 Truck drivers
I122 Supervisors, oil and gas drilling and service
I131 Underground production and development miners
I132 Oil and gas well drillers, servicers, testers and related workers
I142 Oil and gas well drilling workers and services operators
J111 Central control and process operators, mineral and metal processing

Industries With Declining Employment and More Than Ten Target Occupations**NAICS: 322 Paper manufacturing****NOC Categories**

A392 Utilities managers
C054 Land surveyors
C131 Civil engineering technologists and technicians
C133 Industrial engineering and manufacturing technologists and technicians
C143 Industrial instrument technicians and mechanics
C163 Inspectors in public and environmental health and occupational health and safety
H012 Contractors and supervisors, electrical trades and telecommunications occupations
H112 Steamfitters, pipefitters and sprinkler system installers
H212 Industrial electricians
H213 Power system electricians
H221 Stationary engineers and auxiliary equipment operators
H222 Power systems and power station operators
H311 Machinists and machining and tooling inspectors
H411 Construction millwrights and industrial mechanics (except textile)
H412 Heavy-duty equipment mechanics
I132 Oil and gas well drillers, servicers, testers and related workers
I142 Oil and gas well drilling workers and services operators
J111 Central control and process operators, mineral and metal processing
J112 Petroleum, gas and chemical process operators

Industries With Declining Employment and More Than Ten Target Occupations**NAICS: 325 Chemical manufacturing****NOC Categories**

A392 Utilities managers
B553 Customer service, information and related clerks
C054 Land surveyors
C131 Civil engineering technologists and technicians
C133 Industrial engineering and manufacturing technologists and technicians
C143 Industrial instrument technicians and mechanics
C163 Inspectors in public and environmental health and occupational health and safety
H221 Stationary engineers and auxiliary equipment operators
H222 Power systems and power station operators
H311 Machinists and machining and tooling inspectors
H411 Construction millwrights and industrial mechanics (except textile)
H412 Heavy-duty equipment mechanics
J111 Central control and process operators, mineral and metal processing
J112 Petroleum, gas and chemical process operators

Industries With Declining Employment and More Than Ten Target Occupations**NAICS: 331 Primary metal manufacturing****NOC Categories**

A392 Utilities managers
B553 Customer service, information and related clerks
C045 Petroleum engineers
C054 Land surveyors
C131 Civil engineering technologists and technicians
C133 Industrial engineering and manufacturing technologists and technicians
C143 Industrial instrument technicians and mechanics
C163 Inspectors in public and environmental health and occupational health and safety
H012 Contractors and supervisors, electrical trades and telecommunications occupations
H212 Industrial electricians
H213 Power system electricians
H221 Stationary engineers and auxiliary equipment operators
H311 Machinists and machining and tooling inspectors
H326 Welders and related machine operators
H411 Construction millwrights and industrial mechanics (except textile)
H412 Heavy-duty equipment mechanics
I132 Oil and gas well drillers, servicers, testers and related workers
I142 Oil and gas well drilling workers and services operators
J111 Central control and process operators, mineral and metal processing

Industries With Declining Employment and More Than Ten Target Occupations**NAICS: 911 Federal government public administration****NOC Categories**

A123 Architecture and science managers
A392 Utilities managers
B211 Secretaries (except legal and medical)
B511 General office clerks
B531 Accounting and related clerks
B553 Customer service, information and related clerks
C013 Geologists, geochemists and geophysicists
C021 Biologists and related scientists
C023 Agricultural representatives, consultants and specialists
C045 Petroleum engineers
C121 Biological technologists and technicians
C133 Industrial engineering and manufacturing technologists and technicians
C141 Electrical and electronics engineering technologists and technicians
C163 Inspectors in public and environmental health and occupational health and safety
E031 Natural and applied science policy researchers, consultants and program officers
H012 Contractors and supervisors, electrical trades and telecommunications occupations
H213 Power system electricians
H214 Electrical power line and cable workers
H221 Stationary engineers and auxiliary equipment operators
H222 Power systems and power station operators
H412 Heavy-duty equipment mechanics
J112 Petroleum, gas and chemical process operators

Industries With Declining Employment and More Than Ten Target Occupations**NAICS: 912 Provincial and territorial public administration****NOC Categories**

A123 Architecture and science managers
A392 Utilities managers
B211 Secretaries (except legal and medical)
B511 General office clerks
B531 Accounting and related clerks
B553 Customer service, information and related clerks
C021 Biologists and related scientists
C022 Forestry professionals
C023 Agricultural representatives, consultants and specialists
C053 Urban and land use planners
C121 Biological technologists and technicians
C133 Industrial engineering and manufacturing technologists and technicians
C163 Inspectors in public and environmental health and occupational health and safety
E031 Natural and applied science policy researchers, consultants and program officers
H112 Steamfitters, pipefitters and sprinkler system installers
H222 Power systems and power station operators
J112 Petroleum, gas and chemical process operators

Appendix E: Calculating Skills Transferability

The Skills Transferability Matrix is based on a method used by Margaret Roberts (2003). Essentially, Roberts examined various sources of information in order to make an informed decision as to whether a transition is possible between two occupations, based on the common ground, or lack thereof, between them in terms of knowledge and skills required. Roberts uses the terms “destination occupation” and “original occupation,” which here translate to “key occupation” and “target occupation.”

For the purposes of this report, there are a couple of drawbacks to Roberts’ approach. First, the results are presented in absolute terms as “yes” or “no.”⁴⁰ Either a person from one occupation can transition to another occupation, or they can’t. There is no way to compare “yes” occupations to decide which is *more* likely to be a good match with the key occupation. There is also little information in Roberts’ matrix to indicate the magnitude of the gap in skills or knowledge between the two occupations.

The second problem is that the results showed in many cases that the skill level for the key occupations was *lower* than the skill level for the target occupation. This result is not helpful in the present economic circumstances of widespread shortages of skilled labour. The prospect of recruiting primarily those who have higher skill levels would appear to be limited at present.

This report therefore builds on the findings from Roberts’ Skills Transferability Matrix in order to provide more information regarding the closeness of the occupational match and whether the target occupation has a higher or lower level of skills for those skills that are important to the key occupation.

At the most basic level, the Skills Transferability Matrix rests on the analysis done by HRSDC in order to develop its NOC classification system and NOC matrix. As described by Roberts, the NOC is based on four categories: skill level, skill type, occupational mobility, and industry. The four skill levels are explained in Table E1, while Table E2 details the ten skill types.

⁴⁰ Roberts indicates that quantitative analysis was conducted to support the determination of an occupation in the Skills Transferability Matrix, but it is not clear how this was done from the report, and the data used in her analysis were not in her report or found on the HRSDC website.

Table E1	
NOC Skill Level Criteria	
Education/Training	Other
Skill Level A <ul style="list-style-type: none"> • University degree (Bachelor's, Master's, or post-graduate) 	
Skill Level B <ul style="list-style-type: none"> • Two to three years of post-secondary education at community college, institute of technology, or CEGEP; or • two to four years of apprenticeship training; or • three to four years of secondary school and more than two years of on-the-job training, training courses or specific work experience. 	<ul style="list-style-type: none"> • Occupations with supervisory responsibilities are assigned to Skill Level B • Occupations with significant health and safety responsibilities are assigned to Skill Level B
Skill Level C <ul style="list-style-type: none"> • One to four years of secondary school education • Up to two years of on-the job training, training courses, or specific work experience 	
Skill Level D <ul style="list-style-type: none"> • Up to two years of secondary school and short work demonstration or on-the job training 	
Source: Roberts (2003)	

Table E2
Occupation Type
<ol style="list-style-type: none"> 1) Business, Finance, and Administration Occupations 2) Natural and Applied Sciences and Related Occupations 3) Health Occupations 4) Occupations in Social Science, Education, Government Service, and Religion 5) Occupations in Art, Culture, Recreation, and Sport 6) Sales and Service Occupations 7) Trades, Transport, and Equipment Operators and Related Occupations 8) Occupations Unique to Primary Industry 9) Occupations Unique to Processing, Manufacturing, and Utilities 10) Management Occupation

The NOC matrix is arranged by skill level and skill type. The skill level categories are listed on the left side of the matrix and the first nine skill type categories are listed across the top. The tenth skill type, management occupations, is listed along the top of the matrix above the skill levels.

In most cases, each cell of the NOC Matrix consists of a major group. The matrix also provides an overview of the classification structure at the minor group level and illustrates how the NOC is accessible on the basis of skill level, skill type, or some combination of these two criteria.⁴¹

As discussed by Roberts, the NOC structure inherently provides information regarding occupational mobility because it is designed so that there is a greater degree of occupational mobility within a unit group than outside the group, and the placement of unit groups within skill types in the Matrix was designed to illustrate mobility paths. As a result of this structure, there is more likely to be lateral or vertical mobility between groups in close proximity within the NOC matrix than to dissimilar groups. This structure therefore helps to narrow the search to find occupations for which there are mobility prospects.

The methodology has a degree of subjectivity in it, since there is always the question of how to draw the circle around the original occupation in the NOC matrix and therefore how many other occupations to examine. Two different analysts can come up with a different list of target occupations for each priority occupation, given different approaches to defining a match.

For the present study, the inherent occupational clusters in the NOC matrix were used in conjunction with data on education level, major field of study, and skills. The Similarity Indexes presented in Appendix A were also used in this analysis because they provide information regarding the occupations that employ workers with similar education.

The process of developing the Skills Transferability Matrix followed a basic methodology. For each of the key occupations that were identified to have at least one target occupation in the industries selected for in-depth analysis, the occupations that were close to the key occupation in the NOC Matrix were examined. The examination included a comparison of job titles, descriptions, and education. If there was a discrepancy between the occupations that were initially selected and the Similarity Index for the occupational pairing, the education match was examined in greater detail to ensure that a significant portion of the workers in the target occupation had education that is used by the priority occupation.

⁴¹ HRSDC (2001).

Appendix F: Calculating Skills and Knowledge Gap Indicators

The information in the Skills Transferability Matrix was supplemented with information on skill/knowledge levels and skill/knowledge types in order to measure the skills/knowledge gap between occupations. The information in the published NOC Matrix, however, is quite broad. Using only these data, it is impossible to determine the skills/knowledge gap between specific occupations at a fine level of detail. As a result, additional information was drawn from the American Occupational Information Network (OIN). The OIN has a database that rates differences in skills/knowledge between occupations. The information in this database is extensive, with 35 skill and 33 knowledge types, as detailed in Table F1.

Table F1: Skills and Knowledge	
Skill Types	Knowledge Types
Active Learning	Administration and Management
Active Listening	Biology
Critical Thinking	Building and Construction
Learning Strategies	Chemistry
Mathematics	Clerical
Monitoring	Communications and Media
Reading Comprehension	Computers and Electronics
Science	Customer and Personal Service
Speaking	Design
Writing	Economics and Accounting
Complex Problem Solving	Education and Training
Management of Financial Resources	Engineering and Technology
Management of Material Resources	English Language
Management of Personnel Resources	Fine Arts
Time Management	Food Production
Coordination	Foreign Language
Instructing	Geography
Negotiation	History and Archeology
Persuasion	Law and Government
Service Orientation	Mathematics
Social Perceptiveness	Mechanical
Judgment and Decision Making	Medicine and Dentistry
Systems Analysis	Personnel and Human Resources
Systems Evaluation	Philosophy and Theology
Equipment Maintenance	Physics
Equipment Selection	Production and Processing
Installation	Psychology
Operation and Control	Public Safety and Security
Operation Monitoring	Sales and Marketing

Operations Analysis Programming Quality Control Analysis Repairing Technology Design Troubleshooting	Sociology and Anthropology Telecommunications Therapy and Counselling Transportation
Source: US Occupational Information Network	

In the OIN, each skill and knowledge *type* is rated on a scale from 0 to 100 for every occupation. A 0 means that the type of skill or knowledge is not used at all in the given occupation, while a number approaching 100 means that that type of skill or knowledge is of great importance for that occupation. The OIN also rates each occupation in terms of the *level* of skill or knowledge required. A number approaching 100 means that a high skill level is required to perform the job, while a lower number means that a lower level of skill or knowledge is needed.

As an example, chemistry knowledge is highly important to both a chemical technician and a chemist. For both occupations, knowledge of chemistry would be rated highly. However, chemists must have a higher *level* of knowledge of chemistry to perform their job than chemical technicians, so they would have a higher rating than technicians for level of knowledge.

The information available from the OIN database is organized by occupation, as classified by the U.S. Standard Occupational Classification (SOC). There are many differences between the American SOC and the Canadian NOC. In order to use the information in the U.S. database, a concordance between the U.S. and Canadian classification systems was used, based on a draft obtained from Statistics Canada. However, there are still errors in the mapping between the two systems. Furthermore, the NOC-SOC draft concordance was based on an earlier SOC system. A more recent SOC is used to organize the U.S. Occupational Information Network database. The concordance was therefore adjusted to reflect the changes in the U.S. classification.

Some occupational groups in the NOC and SOC are very diverse. In her analysis, Roberts simply stated that the group was heterogeneous and did not indicate a match. In the U.S. database, there is no information on the skills or knowledge attributes of diverse occupations that were typically grouped together as “All Others.” These occupations are therefore not included in the skill and knowledge indicators used here.

Close to 800 distinct occupational categories in the U.S. database had specific information on skills and knowledge, compared to 520 Canadian NOC categories. As a result, Canadian categories are often mapped onto several U.S. categories. In those instances, the U.S. information was weighted to reflect U.S. employment shares.

In order to arrive at a single summary measure of the skills or knowledge gap between occupations, both the importance of the skill or knowledge type and the importance of the level were used. An aggregate skills indicator was constructed for each of key occupations and target occupations included in the Skills Transferability Matrix.

Skills/Knowledge Gap Indicator Equations

If Occupation 1 represents a key occupation and Occupation 2 represents a target occupation that could fill labour shortages in the key occupation, the indicator is represented by the following equation. (The equations here show how the skills gap indicator is obtained; the same process, substituting knowledge types/levels for skills types/levels, is used to obtain the knowledge gap indicator.)

Equation 1

$$\text{Skill Indicator for Occupation 1} = (\text{SKI}_{1,1} * \text{SKL}_{1,1}) + (\text{SKI}_{2,1} * \text{SKL}_{2,1}) + \dots + (\text{SKI}_{35,1} * \text{SKL}_{35,1})$$

SKI is the measure of how important a skill is for a particular occupation. Skill importance is based on a 1-100 scale, but in the equation it is represented as a number from zero to one (i.e., skill importance is normalized so that 100 becomes one). The first number in the subscript represents the skill type (numbered from 1 to 35). The second number in the subscript represents the occupation for which the skill importance level is utilized. In this case it is always “1,” since this equation is for the skills that are important to the first occupation (the priority occupation).

SKL is the measure of the skill level required for a particular skill for a given occupation. The first number in the subscript represents the skills types (numbered from 1 to 35) and is always the same as the first subscripted number in the SKI variable. Again, the 1-100 scale has been normalized so that 100 becomes one. The second number in the subscript represents the occupation for which the skill level is estimated. In this case it is always “1”, since this equation is for the skills level for the first occupation.

This indicator is essentially a weighted average of skill levels, based on the skills that are important to the key occupation (Occupation 1).

In order to compare the skills in another occupation with those of the first occupation, it is essential that the weights be the same, so that only the differences in the skill levels are being compared. The “importance weights” for the first occupation (key occupation) are used with the skill levels of the second occupation (target occupation) to generate Equation 2.

Equation 2

$$\text{Skill Indicator for Occupation 2 Relative to Skills that are Important to Occupation 1} = (\text{SKI}_{1,1} * \text{SKL}_{1,2}) + (\text{SKI}_{2,1} * \text{SKL}_{2,2}) + \dots + (\text{SKI}_{35,1} * \text{SKL}_{35,2})$$

The only difference in this equation is that the subscripts for the skill levels (SKL variables) reflect the skill levels of the second occupation.

By comparing these indicators (Skill Indicator 2 divided by Skill Indicator 1), an indication of the skills gap can be derived that is centred on 1.0. A number above 1.0 indicates a higher level of skill, while a number below 1.0 indicates a lower level of skill.
