Profile of the Sri Lankan Electrical Engineering Industry

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Abstract: The electrical and electronic industry in Sri Lanka, although relatively small in itself, is a key service industry to other industrial sectors as well. In the study presented, a sample of around 300 companies/industries has been the surveyed from around 500 identified companies to obtain the profile of the electrical engineering industry. From the surveyed companies, more than 76.8% are in the electrical industry and these companies account for over 81.1% of the total employment provided. The energy supply sub sector provided 36.7% of the total employment, and is influenced heavily by the large workforce of the CEB. The electrical services industry, which is mostly dominated by the small enterprises, contributes to 20.9%, while electrical products sector accounts for 23.5% of the employment.

The majority of the industry’s employment is concentrated in the operational grades (75.8%) where the technical skills requirements are quite specific for a particular role and quite diverse for different roles. The skills requirement becomes more generalized, with more emphasis for managerial qualifications, as one goes higher up in the occupational structure.

At the operational levels, the vast majority of the workers are with either GCE O/L or A/L qualifications (65.2%). On the other hand, higher education qualifications are much more sought after at the managerial level and decision making level with 72.2% of the managers and 88.8% of the decision makers possessing a degree or above qualifications.

The growth potential of the electrical and electronic industry has been estimated, based on census and statistics of GDP growth rates of similar industries, by categorising the industry into five sub-sectors, namely energy supply, electrical products, electrical services, export oriented electronics, and local consumer electronics and services. The forecasted annual growth of employment for the industry is 14.4% (Electrical industry 13.7% and electronics industry 16.8%).

Keywords: Profile, Electrical, Electronic, Engineering, Industry, Survey

1. Introduction

The electrical and electronic industry plays an important part in the global industrial landscape as a key service industry to other industrial sectors as well by creating large quantities of employment opportunities.

The paper is based mainly on a study that the authors, together with some of their colleagues, have undertaken for the Tertiary and Vocational Education Commission of Sri Lanka. The paper analyses the profile of the electrical and electronic engineering industry and tries to match the training with that required by industry. The electrical and electronics industry in Sri Lanka, is centred in the Western Province (Figure 1.1), and that too mainly around Colombo.

Presently only the Universities, both local and foreign-affiliated, offer Electrical and Electronics Engineering Degrees. In addition, there are number of other institutions that offer Certificate and Diploma courses.
There are also government institutions that offer vocational and short duration courses.

2. Methodology

2.1. Data Collection

Data collection was mainly through two survey questionnaires developed to achieve the objectives. Relevant industries were surveyed mainly to capture the industry profile and the human resource profile while the training institutions were surveyed to explore the available training capacity.

Face-to-face interviews, and e-mail based information enhanced the data collection. Clarifications on the answers provided were taken over the phone whenever required.

2.2. Determination of Industry Profile

In the determination of the Economic Environment of the Industry Sector, the economic environment of the industry sector was targeted through the survey which was designed to capture the following information.

(a) Distribution of the Industry based on the Geographical distribution, and sector-wise distributions based on BOI and Non-BOI.

(b) Nature of the Industry based on products and services output and their composition in export market and local market.

(c) Technological level based on the main areas of operations in electrical and electronics industry (Figure 2.1).

2.3. Determination of Human Resource Profile

In the determination of the Human Resource Profile, the following was performed through the survey:

(a) An occupational mapping exercise to map the available occupations and the occupational categories.

(b) Distribution of the currently employed population by occupation, sex, district, age group, and educational level.

(c) Estimated manpower requirement in different categories of employment of the sector for next five years.

2.4. Determination of Training Profile

In order to capture the details regarding the existing training positions, the following information was captured from the survey:

(a) Currently available training positions by sector, district and mode of training.

(b) Deficits and excesses in the training provisions; calculated in comparison with the manpower requirement of the industry.

2.5. Extrapolations from the Survey

In the survey, in a given sub-categorisation, exact numbers of employees could be obtained only for the CEB. Thus the total employment obtained from the survey has to be adjusted to correspond to the fact that not all employees in the electrical and electronic sector are being sampled. From available information [3] the non-CEB employees in the sector, extrapolated for 2011 is 37,734. The corresponding number caught by the survey is 18,548. This gives a multiplying factor of 2.03 for correcting the data from the survey. Thus a factor of 2 was used in the analysis to correct all other sectors other than the CEB employees to obtain the total workforce.

The total workforce of the country is distributed among the main economic sectors: agriculture (32.5%), industry (24.6%) and
services (42.9%). The informal sector of the economy also plays a major role in the employment opportunities and income generation in the country.

The overall contribution of the informal sector employment is 62.6%, and 37.4% is from the formal sector [4]. The informal employment opportunities in the electrical and electronics industry sector are concentrated in areas such as self-employed personnel in electrical and electronics services sector, small scale home businesses and small scale industries. The majority of the trained personnel in operational grades find employment in informal industry sector and is assumed to correspond to the value of 62.6%. The current training capacity, for the formal sector, is thus calculated by assuming that the only 37.4% of the trained personnel remain.

Growth rates of the “energy supply” and “electrical services” subsectors are estimated based on the GDP growth rate of “electricity” category (around 10%), while the growth rates of other sub sectors are estimated based on the GDP growth rate of the “factory industry” category (around 15%) [5].

3. The determined Profiles

3.1. Industry Profile

The survey shows that around 21% of the establishments surveyed are BOI companies (Figure 3.1).

![Figure 3.1- BOI and Non - BOI distribution](image)

It also shows that the majority of the companies engaged in the electrical and electronic industry is in the private sector (Figure 3.2).

![Figure 3.2- Distribution by ownership](image)

The study has also shown that the manufacturing industry is primarily assisted by the foreign investments. The key products manufactured are transformers, switches, plugs, holders, electric panel boards and electrical cables.

Electronics manufacturing industry is focused on production of a range of electronic components such as magnetic heads, ferrite cores, fiber optic related products, printed circuit boards, compact fluorescents, memory modules, toroidal coils, thermal outfits, bio medical engineering products, household appliances and energy saving lamps.

The Electrical and Electronic export market is mainly driven by the foreign investments. To achieve quality of products, these require skilled labour and qualified middle managers.

| Field          | Sub Category            | No. of Companies | %   | Total no. of Employees | %   |
|----------------|-------------------------|------------------|-----|------------------------|-----|
| Electrical     | Energy supply           | 17               | 8.2 | 10,103                 | 36.7|
|                | Electrical products/equipment | 51               | 24.6| 6,480                  | 23.5|
|                | Electrical services     | 91               | 44.0| 5,760                  | 20.9|
| Electronics    | Export oriented electronics | 6               | 2.9 | 4,093                  | 14.9|
|                | Local consumer electronics and electronics services | 42               | 20.3| 1,099                  | 4.0 |

Table 3.1 shows the distribution of the companies and the employment within each sub-category for 207 valid responses from a sample of 300 companies.

3.2. Human Resource Profile

The human resource profile is categorized into the following key areas

1. Electrical Industry
   a. Energy supply
   b. Electrical products/equipment
   c. Electrical services

2. Electronic Industry
   a. Export oriented electronics
   b. Local consumer electronics and electronic services

In each of the above categorizations, the occupational structure is broadly identified at the following level of hierarchy.

- Decision making level
- Managerial level
- Supervisory level
- Experienced skilled or skilled worker level
- Basic or semi-skilled worker level
The National Vocational Qualification (NVQ) Levels in Sri Lanka identifies seven levels for award of certificates [6]. These levels are equated to the identified hierarchy as given in table 3.2.

Table 3.2- Occupational categories with NVQ levels

| Category                  | NVQ Level |
|---------------------------|-----------|
| Decision making           | 7         |
| Managers                  | 6         |
| Supervisors               | 5         |
| Operational Grades        |           |
| Experienced skilled or skilled workers | 3,4 |
| Basic or semi-skilled workers | 1,2 |

Table 3.3 gives the numbers of positions available at the various occupational categories at present. A pie-chart is shown in Figure 3.3.

Table 3.3- Distribution by occupational category

| Category                  | Number of positions |
|---------------------------|---------------------|
| Decision making           | 642                 |
| Managers                  | 1,911               |
| Supervisors               | 4,096               |
| Operational Grades        |                     |
| Experienced skilled workers | 7,493         |
| Basic or semi-skilled workers | 13,393      |

It is seen that the workers account for over three-quarters of the total workforce, while the decision makers and the managers account for less than one-tenth.

Figures 3.4 through 3.7 show the distribution of the highest qualifications. It is seen that the degree and management qualifications predominate at the higher categories, while the O-Level and the A-Level qualifications predominate at the lowest categories of workers.
Table 3.4- Educational qualifications at each occupational level

| Employment Category | Records | Grade 8 | O/L | A/L | Tech Course | Diploma | Degree | Managerial Qualification (CIMA, MBA) | Post graduate |
|---------------------|---------|---------|-----|-----|-------------|---------|--------|--------------------------------------|--------------|
| Decision making     | 516     | 0       | 3   | 10  | 10          | 35      | 289    | 113                                 | 56           |
| Managers            | 1344    | 0       | 0   | 12  | 82          | 280     | 845    | 104                                 | 21           |
| Supervisors         | 3196    | 0       | 821 | 949 | 521         | 492     | 289    | 124                                 | 0            |
| Operative grades    | 746     | 12      | 372 | 114 | 182         | 45      | 1      | 20                                  | 0            |

Table 3.4 gives the details of the actual qualifications held, and it is seen that multiple qualifications held by the workers.

Table 3.5- Gender distribution of workforce by establishment type

| Establishment type          | Males | Females |
|----------------------------|-------|---------|
| Government establishment   | 1,272 | 160     |
| Private establishment      | 3,790 | 4,679   |
| Other establishment        | 6     | 3       |

Table 3.5 shows that although the females in the government establishments is very low at just over 11%, there is a higher employment of females in the private establishments, at around 55%.

The employment disposition by age is shown in Figure 3.8. It is seen that the industry prefers to retain the experience of the age group 30 – 50. High percentage of employees at the decision making category falls into the over 50 age group.

Figure 3.8- Composition of workforce by age

3.3. Training Profile

The profile of the training organisations was obtained mainly through the survey and from the web. The training requirements of the personnel in electrical and electronics industry depend on the employment category such as decision making, managers, supervisors and operational grades. The training capacities of organizations are summarised by considering the degree awarding universities, institutes offering diploma courses, and institutes for technical courses separately.

Technical and vocational education and training (TVET) has been implemented by a wide range of institutions in the public and private sectors. Most of the public sector institutions operate under the Ministry of Youth Affairs and Skills Development. In addition, many other ministries undertake training through departments and corporations as a secondary function. The available training capacities of the government training organisations for operational grades are summarised in Table A2.3. Similarly in the private sector some of the institutes provide training facilities and certificate courses suitable for operational grades. The training capacities of degree awarding institutions are given in Table A2.1 and the available capacities of diploma level courses are summarised in Table A2.2.

4. Matching the Training with Industry Needs

4.1. The Forecast of Future Human Resource Needs

The manpower requirement of the Electrical and Electronics industry sector has been estimated by considering not only the growth rate but also the employee movements and expansion plans of the industry obtained through the survey.

The estimated manpower opportunities in the electrical and electronic industry in the individual sub-sectors are given in Appendix A1 in tables A1.1 to A1.7 for the operational grades, supervisors and managers.
4.2. Training Provisions

The deficits and excesses in the training provisions are identified by mapping the estimated manpower requirements and current training capacity. The employment opportunities in both formal and informal industry sectors are considered mainly in the operational grades. The mapping of the formal manpower requirement to the current training capacity in operational grades is given in Table A 3.1.

As the training courses are limited in number, the relevant occupations have been grouped and mapped against them. The Further it is found that the occupations and the training courses for the electrician and related occupations are intermingled in nature and thus the training capacities for these have been grouped together although the manpower requirements have been split into four categories. While these categories have a manpower requirement of 1654 in 2012 the current training capacity is 929, which is 37.4% of the current training capacity. There is a deficit of 625 training provisions in electrician related areas. Similarly the other training programmes and related occupations are mapped. It is observed that there is a certain lack of capacity to deliver some skills/competencies related to certain specialized fields such as skills/competencies related to automation and power plant operation. The training provisions in the diploma level and the degree level and the relevant manpower requirements are given in Appendix 1 and 2.

5. Discussion and Conclusion

A profile of the Electrical Engineering Industry including industry profile, human resource profile and training profile has been determined based on the data received from the survey.

The occupational structure has been broadly identified at occupational levels for the following sub-sectors in electrical and electronics industry: a) energy supply, b) electrical products/equipment, c) electrical services, d) export oriented electronics and e) Local consumer electronics and electronics services. From the surveyed companies, more than 76.8% are in the electrical industry and these companies account for over 81.1% of the total employment provided. The energy supply sub sector provided 36.7% of the total employment, and is influenced heavily by the large workforce of the CEB. The electrical services industry, which is mostly dominated by the small enterprises, contributes to 20.9%, while electrical products sector accounts for 23.5% of the employment. Further the electronics sector provides employment only for 18.9% of the workforce.

The majority of the industry’s employment is concentrated in the operational grades (75.8%) where the technical skills requirements become quite specific for a particular role and quite diverse for different roles. The skills requirement become more generalized, with more emphasis for managerial qualifications, as one goes higher up in the occupational structure through supervisory (14.9%), managerial (6.9%) and decision making levels(2.3%).

At the operational levels, the vast majority of the workers are with either GCE O/L or A/L qualifications (65.2%). On the other hand, higher education qualifications are much more sought after at the managerial level and decision making level with 72.2% of the managers and 88.8% of the decision makers possessing a degree or above qualifications.

The growth potential of the electrical and electronic industry has been estimated, based on census and statistics of GDP growth rates of similar industries by categorising the industry into five sub-sectors. The forecasted annual growths of employment for the electrical and electronics industries are 13.7% and 16.8% respectively.

The training profile of the industry sector has been identified at operational grade level, diploma level and degree level. Further the estimated manpower requirements and the training provisions were mapped to identify the excess and deficits especially in the operational grades. The overall contribution of the informal sector employment (62.6%) has been considered in the mapping exercise.

Acknowledgement

Authors wish to acknowledge the Tertiary and Vocational Education Commission (TVEC) of Sri Lanka in providing the funding and other assistance to undertake the study. They also wish to acknowledge the support given by Prof. Ranjit Perera and Dr. Asanka Rodrigo and wish to thank Eng. Buddhika Heendeniya and Eng. Sameera Roshan in doing much of the background work required. Data made available by Mr. Maldeni, Deputy Director of Export Development Board is also gratefully acknowledged.
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Appendix 1 - Estimated manpower requirements in individual subsectors

The estimated manpower requirements of electrical and electronics sectors are given in Table A1.1 and Table A1.2 respectively.

### Table A1.1- Electrical sub sector

| Sub sector | Category          | Total workforce in 2011 | Predicted Manpower Opportunity |
|------------|-------------------|--------------------------|---------------------------------|
|            |                   |                          | 2012  | 2013  | 2014  | 2015  | 2016  |
|            |                   |                          |       |       |       |       |       |
| Energy supply sector | Decision making | 147                       | 18    | 17    | 17    | 17    | 17    |
|            | Managers          | 880                       | 109   | 105   | 103   | 101   | 100   |
|            | Supervisors       | 1,644                     | 203   | 196   | 192   | 189   | 187   |
|            | Operative Grades  | 8,548                     | 1,055 | 1,020 | 997   | 982   | 974   |
|            | Total             | 11,219                    | 1,385 | 1,338 | 1,309 | 1,289 | 1,278 |
| Electrical services | Decision making | 598                       | 68    | 66    | 64    | 63    | 63    |
|            | Managers          | 1,056                     | 121   | 117   | 115   | 113   | 112   |
|            | Supervisors       | 3,276                     | 373   | 361   | 352   | 347   | 344   |
|            | Operative Grades  | 6,590                     | 825   | 798   | 780   | 768   | 762   |
|            | Total             | 11,520                    | 1,387 | 1,342 | 1,311 | 1,291 | 1,281 |
| Electrical products | Decision making | 268                       | 45    | 45    | 45    | 46    | 46    |
|            | Managers          | 784                       | 135   | 135   | 135   | 136   | 136   |
|            | Supervisors       | 964                       | 164   | 164   | 165   | 165   | 166   |
|            | Operative Grades  | 10,944                    | 1,879 | 1,884 | 1,888 | 1,893 | 1,898 |
|            | Total             | 12,960                    | 2,223 | 2,228 | 2,233 | 2,240 | 2,246 |

### Total Electrical Sector

| Decision making | 192 | 24 |
| Managers        | 438 | 75 |
| Supervisors     | 952 | 160|
| Operative Grades| 8,802 | 1,468 |
| Total           | 10,384 | 1,736 |
The estimated manpower requirement of the major operational grades of the electrical and the electronics sectors are given in Table A1.3 and A1.4 respectively.

### Table A1.3- Operational grades in Electrical sector

| Occupation                        | Current workforce in 2011 | Estimated manpower requirement |
|-----------------------------------|---------------------------|--------------------------------|
|                                   |                           | 2012  | 2013  | 2014  | 2015  | 2016  |
| Machine Operator                  | 4,230                     | 610   | 600   | 594   | 591   | 589   |
| Electrician                       | 2,824                     | 406   | 400   | 396   | 393   | 392   |
| Technician                        | 2,322                     | 335   | 330   | 326   | 324   | 324   |
| Unskilled Worker                  | 1,949                     | 214   | 207   | 202   | 199   | 197   |
| Worker                            | 1,768                     | 255   | 251   | 248   | 247   | 246   |
| Semi-Skilled Technical Worker     | 1,522                     | 167   | 161   | 158   | 155   | 154   |
| Lineman                           | 1,299                     | 142   | 138   | 135   | 133   | 131   |
| Trainee                           | 1,022                     | 147   | 145   | 144   | 143   | 142   |
| Helper                            | 908                       | 131   | 129   | 128   | 127   | 127   |
| Trainee Technician                | 824                       | 93    | 90    | 88    | 87    | 87    |
| Production Worker                 | 788                       | 114   | 112   | 111   | 110   | 110   |
| Technician/Electrician           | 696                       | 100   | 99    | 98    | 97    | 97    |
| Electrical Assistant              | 478                       | 69    | 68    | 67    | 67    | 67    |
| Control Room Operator            | 419                       | 46    | 44    | 43    | 43    | 42    |
| Labourer                         | 408                       | 59    | 58    | 57    | 57    | 57    |
| Production Assistant             | 400                       | 58    | 57    | 56    | 56    | 56    |
| Skilled Technical Worker         | 343                       | 38    | 36    | 36    | 35    | 35    |

The estimated manpower requirement of the major supervisory grades are given in Table A1.5 and A1.6 respectively.

### Table A1.4- Operational grades in Electronics sector

| Occupation                        | Current workforce in 2011 | Estimated manpower requirement |
|-----------------------------------|---------------------------|--------------------------------|
|                                   |                           | 2012  | 2013  | 2014  | 2015  | 2016  |
| Production Worker                 | 3,944                     | 658   | 659   | 661   | 663   | 665   |
| Production Line Worker            | 2,336                     | 390   | 390   | 392   | 393   | 394   |
| Operator                          | 948                       | 158   | 158   | 159   | 159   | 160   |
| Technician                        | 376                       | 63    | 63    | 63    | 63    | 63    |
| Electrician                       | 116                       | 19    | 19    | 19    | 19    | 20    |
| Technician/Electrician           | 106                       | 18    | 18    | 18    | 18    | 18    |
| Helper                            | 80                        | 13    | 13    | 13    | 13    | 13    |
| Cleaner                           | 60                        | 10    | 10    | 10    | 10    | 10    |
| Production Process Worker         | 48                        | 8     | 8     | 8     | 8     | 8     |

### Table A1.5- Supervisory grades in Electrical sector

| Occupation                        | Current workforce in 2011 | Estimated manpower requirement |
|-----------------------------------|---------------------------|--------------------------------|
|                                   |                           | 2012  | 2013  | 2014  | 2015  | 2016  |
| Electrical Supervisor             | 1,382                     | 174   | 169   | 167   | 165   | 164   |
| Electrical Superintendent         | 1,192                     | 131   | 127   | 125   | 123   | 122   |
| Workshop Supervisor               | 1,034                     | 130   | 127   | 125   | 123   | 122   |
| Supervisor                        | 520                       | 65    | 64    | 63    | 62    | 62    |
| Engineering Assistant             | 279                       | 34    | 32    | 32    | 32    | 32    |
| Team Leader                       | 164                       | 21    | 20    | 20    | 20    | 19    |
| Engineer                          | 134                       | 17    | 16    | 16    | 16    | 16    |
| Superintendent                    | 130                       | 15    | 15    | 15    | 15    | 14    |
| Assistant Engineer                | 100                       | 13    | 12    | 12    | 12    | 12    |
| Mechanical Superintendent         | 91                        | 10    | 10    | 10    | 10    | 10    |
| Foreman                           | 76                        | 10    | 9     | 9     | 9     | 9     |
Table A1.6- Supervisory grades in Electronics sector

| Occupation                | Current workforce in 2011 | Estimated manpower requirement |
|---------------------------|---------------------------|--------------------------------|
|                           |                           | 2012 | 2013 | 2014 | 2015 | 2016 |
| Supervisor                | 214                       | 36   | 36   | 36   | 36   | 36   |
| Engineer                  | 196                       | 33   | 33   | 33   | 33   | 33   |
| Team Leader               | 106                       | 18   | 18   | 18   | 18   | 18   |
| Group Leader              | 86                        | 14   | 14   | 14   | 15   | 15   |
| Technical Officer         | 76                        | 13   | 13   | 13   | 13   | 13   |
| Electrical Supervisor     | 58                        | 10   | 10   | 10   | 10   | 10   |

The estimated manpower requirements of major managerial grades of electrical and electronics sectors are given in Table A1.7 and A1.8 respectively.

Table A1.7- Managers in Electrical sector

| Occupation                           | Current workforce in 2011 | Estimated manpower requirement |
|--------------------------------------|---------------------------|--------------------------------|
|                                      |                           | 2012 | 2013 | 2014 | 2015 | 2016 |
| Electrical Engineer                  | 876                       | 103  | 100  | 99   | 98   | 97   |
| Engineer                             | 330                       | 44   | 43   | 43   | 42   | 42   |
| Manager                              | 180                       | 24   | 24   | 23   | 23   | 23   |
| Engineer Mechanical/Civil/Other      | 155                       | 18   | 18   | 18   | 18   | 17   |
| Sales/Commercial/Customer Manager    | 108                       | 14   | 14   | 14   | 14   | 14   |
| HR and Administrative Manager        | 88                        | 12   | 12   | 11   | 11   | 11   |
| Executive                            | 84                        | 11   | 11   | 11   | 11   | 11   |
| Assistant Engineer                   | 80                        | 11   | 11   | 10   | 10   | 10   |
| Plant Manager                        | 68                        | 9    | 9    | 9    | 9    | 9    |
| Project Manager                      | 66                        | 9    | 9    | 9    | 8    | 8    |
| Assistant Manager                    | 64                        | 9    | 8    | 8    | 8    | 8    |
| R&D and Technical Manager            | 56                        | 8    | 7    | 7    | 7    | 7    |

Table A1.8- Managers in Electronics sector

| Occupation                           | Current workforce in 2011 | Estimated manpower requirement |
|--------------------------------------|---------------------------|--------------------------------|
|                                      |                           | 2012 | 2013 | 2014 | 2015 | 2016 |
| Engineer                             | 114                       | 20   | 20   | 20   | 20   | 20   |
| Manager                              | 88                        | 15   | 15   | 15   | 15   | 15   |
| Design Engineer                      | 42                        | 7    | 7    | 7    | 7    | 7    |
| Executive                            | 26                        | 4    | 4    | 4    | 4    | 4    |
| Assistant Manager                    | 20                        | 3    | 3    | 3    | 3    | 3    |
| Quality Assurance Manager            | 18                        | 3    | 3    | 3    | 3    | 3    |
| HR and Administrative Manager        | 12                        | 2    | 2    | 2    | 2    | 2    |
| Operational Manager                  | 12                        | 2    | 2    | 2    | 2    | 2    |
Appendix 2 - Training Capacities in the Electrical and Electronics Industry

Table A2.1- Training capacity in universities

| Institution                         | Course                                      | Specialisation                      | Duration (years) | Nature  | Annual Capacity |
|-------------------------------------|---------------------------------------------|-------------------------------------|------------------|---------|-----------------|
| University of Moratuwa              | Bachelor of Science of Engineering          | Electrical Engineering              | 4                | Fulltime | 100             |
|                                     | Bachelor of Science of Engineering          | Electronics and telecommunication Engineering | 4                | Fulltime | 100             |
| University of Peradeniya            | Bachelor of Science of Engineering          | Electrical and Electronics Engineering | 4                | Fulltime | 100             |
| University of Ruhuna                | Bachelor of Science of Engineering          | Electrical and Information Engineering | 4                | Fulltime | 75              |
| Open University of Sri Lanka        | Bachelor of Technology in Engineering       | Electronic and Communication Engineering | 4                | Distance |                 |
|                                     | Bachelor of Technology in Engineering       | Electrical Engineering              | 4                | Distance |                 |
| Kotalawala Defence University       | Bachelor of Science of Engineering          | Electrical and electronic Engineering | 4                | Fulltime | 30              |
|                                     | Bachelor of Science of Engineering          | Electronics and telecommunication engineering | 4                | Fulltime | 30              |
| UNIVOTEC                           | Bachelor of Technology                      | Mechatronics Technology             | 3 (basic)        | Part time| 25              |
|                                     | Bachelor of Technology                      | Building Services Technology        | 3 (basic)        | Part time| 25              |
|                                     |                                             |                                     |                  |         |                 |
|                                     |                                             |                                     |                  |         | **Total** 485    |

Note: Graduates from private universities and foreign universities are not included

Table A2.2- Training capacity of Diploma courses in electrical and electronics field

| Institution | Course                                      | Area            | Duration (years) | Nature    | Annual Capacity |
|-------------|---------------------------------------------|-----------------|------------------|-----------|-----------------|
| ITUM        | National Diploma in Technology (NDT)        | Electrical      | 3 years          | Full time | 40              |
|             |                                             | Electronic and Telecommunication | 3 years          | Full time | 40              |
| SLIATE      | Higher National Diploma in Engineering (HNDE) | Electrical/Electronics | Full time |           |                 |
| NAITA-IET   | National Diploma in Engineering Sciences (NDES) | Electronics   | Full time |           | 30              |
|             |                                             | Electrical Power | Full time |           | 50              |
|             |                                             |                 |                 |           | **Total** 160    |
| Occupation Area                  | Institution | Course Name                                                                 | Duration (months) | Annual Capacity | Total Capacity |
|---------------------------------|-------------|-----------------------------------------------------------------------------|-------------------|-----------------|----------------|
| Electrical Appliances Repairer  | E DTET      | Certificate in Household Electrical Appliances Repairing                     | 6                 | 125             | 233            |
|                                 | E VTA       | Household Electrical & Electronic Equipment Repairer                          | 6                 | 108             |                |
| Electrical Installation worker  | E DTET      | Electrical Installation work(MC)                                             | 6                 | 17              | 17             |
| Electrical Wiring related worker| E DTET      | Certificate in Electrical Trade                                               | 6                 | 9               | 171            |
|                                 | E DTET      | Electrical wiring                                                             | 6                 | 9               |                |
|                                 | E DTET      | Electrical wiring(MC)                                                         | 6                 | 63              |                |
| Electrician                     | E DTET      | Electrician-NVQ LEVEL 03                                                      | 12                | 28              |                |
|                                 | E DTET      | NCECP Industrial Electrician                                                  | 24                | 750             |                |
|                                 | E DTET      | Electrician(MC)                                                              | 6                 | 15              |                |
|                                 | E CGTTI     | Electrical power                                                             | 42                | 40              |                |
|                                 | E Youth Center-NYSC | Electrician                          | 12                | 15              |                |
|                                 | E NAITA-ATI | Electrician (special)                                                        | 36                | 36              |                |
|                                 | E VTA       | Electrician                                                                  | 6                 | 1018            |                |
| Electronic equipment repairer   | EN DTET     | Certificate in Radio, TV, & Allied Equipment Repairing                        | 6                 | 14              | 161            |
|                                 | EN VTA      | Radio, TV And Allied Equipment Repairer                                       | 6                 | 132             |                |
|                                 | EN Youth Center-NYSC | Radio and TV Allied Equipment Repairer                                          | 12                | 15             |                |
| Motor Winder                    | E VTA       | Electric Motor Winder                                                         | 6                 | 104             | 104            |
| Technical Officer               | E/EN DTET   | National Certificate for Industrial Technicians (Electrical & Electronics Engineering) | 24                | 117             | 117            |
| Technician                      | EN DTET     | NCECP Electronics                                                            | 24                | 645             | 701            |
|                                 | EN NAITA-ATI| Electronics Craftsman (Special)                                               | 36                | 56              |                |
| Computer hardware technician    | EN Youth Center-NYSC | Computer hardware technician                                               | 6                 | 30              | 166            |
|                                 | EN VTA      | Computer Hardware Technician                                                  | 6                 | 136             |                |

Note: E-Electrical, EN-Electronics, MC- Mahinda Chinthana
NCECP-National Certificate in Engineering Craft Practice
Sources: Statistical Handbook on Technical Education 2008/09, Department of Technical Education & Training, [http://www.techedu.gov.lk](http://www.techedu.gov.lk) [7]
Prospectus 2009 / 2010, Department of Technical Education & Training, [http://www.techedu.gov.lk](http://www.techedu.gov.lk)
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### Appendix A3 - Deficits and Excess in Training Provisions

#### Table A3.1: Mapping of manpower requirement to training capacity in operational grades

| Relevant occupation                                                                 | Manpower requirement in 2012 | Area of Training Course                  | Current Training Capacity |
|-------------------------------------------------------------------------------------|------------------------------|------------------------------------------|---------------------------|
| Technician, Electrician, Electrical Assistant, Fitter, Electrical Helper, Electrical Trainee, | 651                          | Electrician                              |                          |
| Repairman, Fan Technician, Serviceman, AC Technician, Sewing Machine Technician     | 9                            | Electrical appliance repairer/ Electronics equipment repairer |                          |
| Wireman, Lineman, Jointer                                                          | 152                          | Electrical wiring related worker         | 929                      |
| Technician, Semi-Skilled Technical Worker, Trainee Technician, Skilled Technical Worker, Technical Assistant, Junior Technician, Test Bench Technician, Junior Foreman, Assembly Line Technician, Workshop Technician, Trainee, Trainee Worker | 842                          | Electrician, EW, EAR, EER                |                          |
| **Sub-Total**                                                                       | **1654**                     | **Motor Winder**                         | **39**                   |
| Operator, Electronic Technician, Technician-EN, Technical Assistant-EN, Trainee Technician-EN, Craftsman, Hearing Aid Fitter, Programmer, Barcode Painter/Printer/Worker, Computer Repairman | 246                          | Technician (Electronics)                 | 262                      |
| Production Worker, Production Line Worker, Packaging Line Worker, Production Assistant, Factory Worker, Section Supervisor, Team Leader, Process Leader, Production Process Worker, Project Officer, Site Officer, Data Entry Operator | 1257                         | In house training                        |                          |
| Unskilled Worker, Worker, Helper, Labourer, Helper Loading, Helper Packing, Helper Production, Mechanical Helper, Helper Boiler, Helper Quality, Machine Helper, Office Assistant, Field Assistant, Workshop Helper, Maintenance Helper, Cleaner, Laboratory Assistant, Data Processor | 834                          |                                        |                          |
| Automation Technician                                                               | 9                            | AT-NEW                                   |                          |
| Power Plant Operator, Power House assistant, Power Plant Assistant, Control Room Operator | 78                            | PP-NEW                                   |                          |
| **Total**                                                                           | **4081**                     | **1230**                                 |                          |

*Note: The current training capacity is calculated by assuming that the only 37.4% of trained personnel remain in the formal industry sector.*
