Electricity, gas, water and waste services

…covers the electricity supply sector, the gas supply sector, water supply, sewerage and drainage services and waste collection, haulage, treatment and disposal services.

Key points

- The electricity, gas, water and waste services industry employs approximately 134,200 persons, accounting for around one per cent of the total Australian workforce
- While it is the smallest employing industry within the Australian economy, employment in electricity, gas, water and waste services grew strongly over the past five years, and future growth to 2014-15 is expected to exceed the all-industry average
- The majority of electricity, gas, water and waste services workers are employed in large enterprises, with 68 per cent employed in businesses that have 200 staff or more
- A higher proportion of electricity, gas, water and waste services workers are employed in regional and remote areas (42 per cent), as compared to the all-industry average of 37 per cent[1]
- The industry workforce is predominantly male (79 per cent) and comprised of full-time workers (91 per cent)
- 26 per cent of workers in electricity, gas, water and waste services have completed a Certificate III or IV level qualification, compared to 18 per cent for all industries
- A detailed employment profile for electricity, gas, water and waste services (including information on its workforce, industry and occupational characteristics) can be found at www.skillsinfo.gov.au

Industry outlook

The electricity, gas, water and waste services sector is a small but important industry within the Australian economy: providing essential services and utilities, and employing 1.2 per cent of the total Australian workforce. In terms of industry value added, electricity, gas and water services contributed 2.3 per cent ($25.3b) to the national economy in 2009-10.[2]

[1] Regional and remote areas are defined as those outside state capital cities.
[2] 'Industry value added' is the measure of the contribution by industry to gross domestic product (GDP) at basic prices. ABS (2010) *Australian System of National Accounts* (Cat. no. 5204.0).

Short-term growth

The electricity, gas, water and waste services industry has experienced strong employment growth over the past five years, albeit from a small base. Recent growth is expected to slow somewhat into the future, but is still anticipated to outstrip average employment growth across all industries, driven in part by the deregulation of energy markets and demand for renewable sources of energy.[3]

Table 1 Current and past employment in electricity, gas and waste services

Industry	Current employment		Past growth: five years	
	'000	% of total	'000	%
Electricity, gas, water and waste services	134.2	1.2	35.4	35.8
All employed	**11,044.6**	**100.0**	**1,060.1**	**10.6**

Population: Employed people.
Source: DEEWR analysis of ABS trend data, May 2010 (Cat no: 6291.0.55.003).

Long-term growth

Skills Australia used scenario planning and economic modelling undertaken by Access Economics to calculate the skills demand for the economy into the future. The three scenarios are:

- Open Doors – assumes an industry and occupation structure that is driven by greater global openness, high economic growth and high productivity
- Low Trust Globalisation – assumes global competition but with more moderate participation rates, productivity growth and rates of growth of net migration, and accordingly, medium economic growth
- Flags – assumes a more protectionist economy, with a greater move to domestic self-sufficiency, a lower rate of net migration and productivity growth, and accordingly, assumes a low rate of economic growth.

Employment in the industry is forecast to grow relatively strongly in the Flags world however employment growth is forecast to contract within the worlds of Low Trust Globalisation and Open Doors.[4]

[3] DEEWR (2010) *Employment Outlook for Electricity, Gas, Water and Waste Services*, SkillsInfo.

[4] A description of the scenarios and the Access Economics modeling of employment in each, with state and territory breakdowns, is available at the Skills Australia web-site www.skillsaustralia.gov.au.

Table 2 Average annual industry employment growth in three scenarios, 2010-15 and 2010-25 (%pa)

Industry	Open doors		Low-trust globalisation		Flags	
	2015	2025	2015	2025	2015	2025
Electricity, gas, water and waste services	**0.2**	**-0.3**	**0.1**	**-0.6**	**4.1**	**3.2**
Electricity supply	-0.8	-1.3	-0.5	-1.3	5.2	4.2
Gas supply	-0.9	-1.3	-0.6	-1.3	5.2	4.2
Water supply, sewerage and drainage services	0.6	-0.2	0.1	-0.6	3.7	2.8
Waste collection, treatment and disposal services	2.4	1.6	1.7	1.0	0.6	-0.1
All industries	**2.6**	**2.1**	**1.9**	**1.5**	**1.3**	**0.9**

Source: Access Economics (2009) *Economic modelling of skills demand*, Table D1; conversion to ANZSIC by CEET (2010).

Average industry employment growth per annum within the Flags world for electricity, gas, water and waste services is expected to be more than three times greater than the Australian average between 2010 and 2025. Both electricity and gas supply and water, sewerage and drainage services show downturns within the Open Doors and Low Trust Globalisation scenarios and indicate strong growth in the Flags scenario. This forecast growth is due to the resurgence in manufacturing employment under Flags as a result of protectionist policies. That resurgence in manufacturing creates significant additional demand for utilities services. The forecasts do not take into account any corresponding increase in demand for alternative energy sources under the 'green' settings of Open Doors.[5]

Occupation outlook

Key occupations

The top ten electricity, gas, water and waste services occupations account for less than one third (32.4 per cent) of industry employment, reflecting the diversity of employment areas across the sector.

[5] The projections commissioned by Skills Australia will be revisited in 2011, and some adjustments to the scenario settings are expected. This may affect forecasts for the energy sector. Further information will be available from the Skills Australia web-site www.skillsaustralia.gov.au during 2011.

Table 3 Top ten electricity, gas, water and waste services occupations

Occupation		People employed	Industry employment
ANZSCO		'000	% of total
7331	Truck drivers	9.1	6.0
3411	Electricians	8.7	5.7
3422	Electrical distribution trades workers	7.2	4.7
7129	Other stationary plant operators	4.5	3.0
3992	Chemical, gas, petroleum and power plant operators	3.6	2.4
5412	Inquiry clerks	3.6	2.4
2332	Civil engineering professionals	3.5	2.3
3232	Metal fitters and machinists	3.1	2.0
2333	Electrical engineers	3.1	2.0
5111	Contract, program & project admin.	3.0	2.0
Total		**366.3**	**74.0**

Source: ABS (2010) *Labour Force Australia*, detailed quarterly report, 2009 average of four quarters (Cat. no. 6291.0.55.003).

Short-term growth

Table 4 shows recent past and forecast growth rates for the occupations that feature prominently within the industry. **Note that the figures refer to the expected number of people in these occupations across all industries, not just in the electricity, gas, water and waste services industry**.

Table 4 Current and past employment in key occupations

Occupation		Current employment (all industries)		Past growth: five years	
ANZSCO		'000	% of total	'000	%
2332	Civil engineering professionals	44.7	0.4	13.1	41.3
2333	Electrical engineers	18.7	0.2	5.8	44.5
3232	Metal fitters and machinists	109.0	1.0	16.6	18.0
3411	Electricians	132.8	1.2	34.0	34.4
3422	Electrical distribution trades workers	13.7	0.1	5.4	65.9
3992	Chemical, gas, petroleum and power generation plant operators	9.9	0.1	1.0	10.9
5111	Contract, program and project administrators	103.5	0.9	39.7	62.1
5412	Inquiry clerks	71.6	0.6	9.4	15.1
7129	Other stationary plant operators	19.1	0.2	3.1	19.0
7331	Truck drivers	170.6	1.5	16.7	10.8
All employed		**11,044.6**	**100.0**	**1,060.1**	**10.6**

Population: Employed people.
Source: DEEWR analysis of ABS trend data, May 2010 (Cat no: 6291.0.55.003).

Future growth is expected to be strong in a number of key electricity, gas, water and waste services occupations. All occupations aside from truck drivers and chemical, gas, petroleum and power generation plant operators are expected to achieve a higher rate of growth to 2014-15 than the Australian average.

Long-term growth and job openings

Table 5 indicates the long-term net job growth per annum expected in these occupation groups, according to Access Economics' scenario modelling.

The average annual growth for each of the key electricity, gas, water and waste services occupations is expected to vary over the longer-term. Occupational growth for engineering professionals is anticipated to meet or exceed the Australian average, regardless of which scenario eventuates. Similarly, contract, program and project administrators and call or contact centre information clerks have above-average expected growth compared to other groups. None of the occupation groups are expected to show negative growth in either the medium-term (to 2015) or the longer-term (to 2025).

Table 5 Average annual occupation growth in three scenarios, 2010-15 and 2010-25 (%pa)

Industry		Open doors		Low-trust globalisation		Flags	
ANZSCO		2015	2025	2015	2025	2015	2025
233	Engineering professionals	2.6	2.1	2.0	1.5	2.0	1.5
323	Mechanical engineering trades workers	1.4	1.2	0.7	0.4	1.8	1.6
341	Electricians	1.7	1.8	1.1	1.1	1.0	1.1
342	Electronics & telecommunications trades workers	1.7	1.8	1.1	1.1	1.0	1.1
399	Miscellaneous technicians and trades workers	1.8	1.6	1.2	0.9	1.1	0.8
511	Contract, program and project administrators	2.8	2.3	2.2	1.7	1.5	1.0
541	Call or contact centre information clerks	3.1	2.4	2.5	1.8	1.7	1.0
712	Stationary plant operators	0.8	1.1	0.2	0.5	1.1	1.3
733	Truck drivers	2.6	2.1	2.0	1.4	1.1	0.5
All occupations		**2.6**	**2.1**	**1.9**	**1.5**	**1.3**	**0.9**

Source: Access Economics (2009) *Economic modelling of skills demand*, Table D4 (ASCO); conversion to ANZSCO by CEET (2009). Three-digit ANZSCO job titles are used in this analysis.

As noted, the data in Table 5 concerns employment growth in an industry. The number of total **job openings** which includes both employment growth and **the replacement resulting from individuals leaving the occupation net of those re-entering** can also be estimated. This replacement requirement is particularly significant in industries where there are high numbers of people retiring or leaving the occupation.

Table 6 shows the average annual job openings projected in key electricity, gas, water and waste services occupations to 2025.

Under Open Doors, the highest proportion of job openings per annum is forecast among truck drivers (4.2 per cent) and electronics and telecommunications trades workers (3.9 per cent). Under the Flags scenario, on the other hand, mechanical and engineering trades workers are expected to have 6,400 job openings per annum (or 4.0 per cent), which is higher than the all-occupation average of 3.2 per cent.

Table 6 Average annual job openings, pa 2010 to 2025, in three scenarios

Occupation		Open doors		Low trust globalisation		Flags	
ANZSCO		('000)	%	('000)	%	('000)	%
233	Engineering professionals	5.0	2.9	3.8	2.3	3.7	2.3
323	Mechanical engineering trades workers	5.6	3.6	4.2	2.8	6.4	4.0
341	Electricians	4.9	3.4	3.7	2.8	3.6	2.7
342	Electronics & telecommunications trades workers	4.7	3.9	3.6	3.3	3.5	3.2
399	Miscellaneous technicians and trades workers	2.4	3.0	1.8	2.4	1.7	2.3
511	Contract, program and project administrators	2.3	2.9	1.7	2.3	1.1	1.6
541	Call or contact centre information clerks	4.6	3.8	3.7	3.2	2.6	2.4
712	Stationary plant operators	3.7	2.9	2.7	2.2	3.8	3.0
733	Truck drivers	8.6	4.2	6.8	3.5	4.7	2.6
All occupations		**579.1**	**4.4**	**465.9**	**3.8**	**373.7**	**3.2**

Source: Access Economics (2009) *Economic modelling of skills demand*, Table D4 (ASCO); conversion to ANZSCO and net replacement demand by CEET (2009). Three-digit ANZSCO job titles are used in this analysis.

As Table 7 shows, nearly as many, or in some cases, more job openings are created by replacement as by new growth. For example, for mechanical engineering trades workers in the Open Doors world, it is expected that nearly twice as many job openings (59,200) will be created by replacement requirements than from new jobs (30,200). Electronics and telecommunications trades workers, stationary plant operators and truck drivers are also forecast to have high replacement demand under Open Doors. This is attributable to workforce demographics such as the age profile of current workers, and workforce dynamics such as the rate of job turnover.

Table 7 Total job openings (growth and net replacement) in three scenarios, 2010 to 2025

7.1 Open Doors

Occupation ANZSCO		Total growth (persons) ('000)	%	Net replacement estimates (persons) ('000)	%	Total job openings (persons) ('000)	%
233	Engineering professionals	57.0	71.5	22.7	28.5	79.7	100.0
323	Mechanical engineering trades workers	30.2	33.8	59.2	66.2	89.4	100.0
341	Electricians	40.7	52.2	37.3	47.8	78.0	100.0
342	Electronics & telecommunications trades workers	34.2	45.8	40.6	54.2	74.8	100.0
399	Miscellaneous technicians and trades workers	20.0	51.6	18.8	48.4	38.8	100.0
511	Contract, program and project administrators	29.2	79.4	7.6	20.6	36.7	100.0
541	Call or contact centre information clerks	45.1	61.2	28.6	38.8	73.7	100.0
712	Stationary plant operators	24.1	41.3	34.4	58.7	58.5	100.0
733	Truck drivers	67.0	48.8	70.2	51.2	137.2	100.0
All occupations		**4,425.7**	**47.8**	**4,840.1**	**52.2**	**9,265.8**	**100.0**

7.2 Low-Trust Globalisation

Occupation ANZSCO		Total growth (persons) ('000)	%	Net replacement estimates (persons) ('000)	%	Total job openings (persons) ('000)	%
233	Engineering professionals	40.0	65.0	21.5	35.0	61.4	100.0
323	Mechanical engineering trades workers	11.6	17.4	55.2	82.6	66.8	100.0
341	Electricians	24.0	40.9	34.8	59.1	58.8	100.0
342	Electronics & telecommunications trades workers	20.2	34.9	37.9	65.1	58.1	100.0
399	Miscellaneous technicians and trades workers	11.5	39.4	17.7	60.6	29.2	100.0
511	Contract, program and project administrators	20.5	74.1	7.1	25.9	27.6	100.0
541	Call or contact centre information clerks	32.2	54.3	27.1	45.7	59.3	100.0
712	Stationary plant operators	10.3	24.2	32.1	75.8	42.4	100.0
733	Truck drivers	42.3	39.1	65.9	60.9	108.2	100.0
All occupations		**2,892.9**	**38.8**	**4,561.3**	**61.2**	**7,454.2**	**100.0**

7.3 Flags

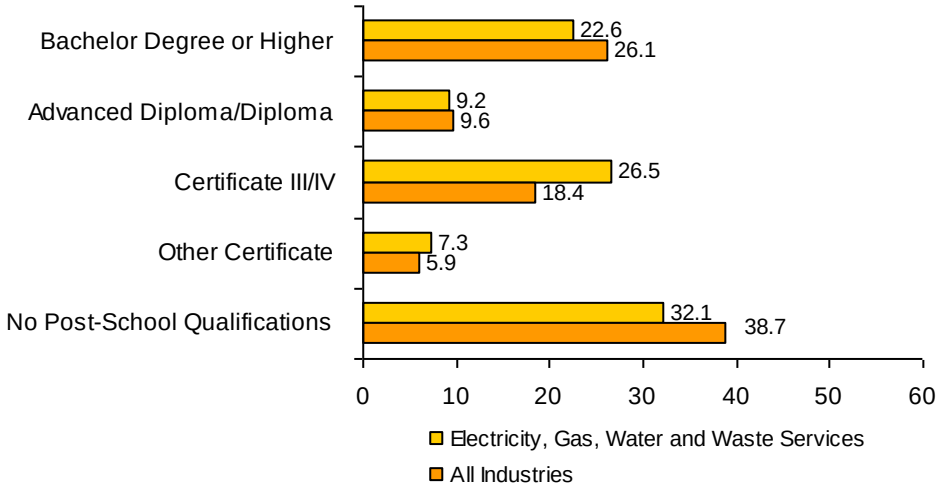
Occupation ANZSCO		Total growth (persons) ('000)	Total growth (persons) %	Net replacement estimates (persons) ('000)	Net replacement estimates (persons) %	Total job openings (persons) ('000)	Total job openings (persons) %
233	Engineering professionals	38.5	64.3	21.3	35.7	59.8	100.0
323	Mechanical engineering trades workers	41.5	40.5	61.1	59.5	102.6	100.0
341	Electricians	22.6	39.7	34.3	60.3	57.0	100.0
342	Electronics & telecommunications trades workers	18.7	33.3	37.3	66.7	56.0	100.0
399	Miscellaneous technicians and trades workers	10.0	36.4	17.5	63.6	27.5	100.0
511	Contract, program and project administrators	11.5	63.1	6.7	36.9	18.2	100.0
541	Call or contact centre information clerks	16.4	39.3	25.2	60.7	41.6	100.0
712	Stationary plant operators	27.1	44.0	34.5	56.0	61.6	100.0
733	Truck drivers	15.0	19.7	60.8	80.3	75.8	100.0
All occupations		**1,681.7**	**28.1**	**4,297.2**	**71.9**	**5,978.9**	**100.0**

Source: Access Economics (2009) *Economic modelling of skills demand*, Table D4 (ASCO); conversion to ANZSCO and net replacement demand by CEET (2009). Three-digit ANZSCO job titles are used in this analysis.

Education and training profile

More than a quarter (26.5 per cent) of workers in electricity, gas, water and waste services have completed a Certificate III or IV level qualification, compared to 18.4 per cent for all industries.

Figure 1 Education profile of the electricity, gas, water and waste services workforce (%)



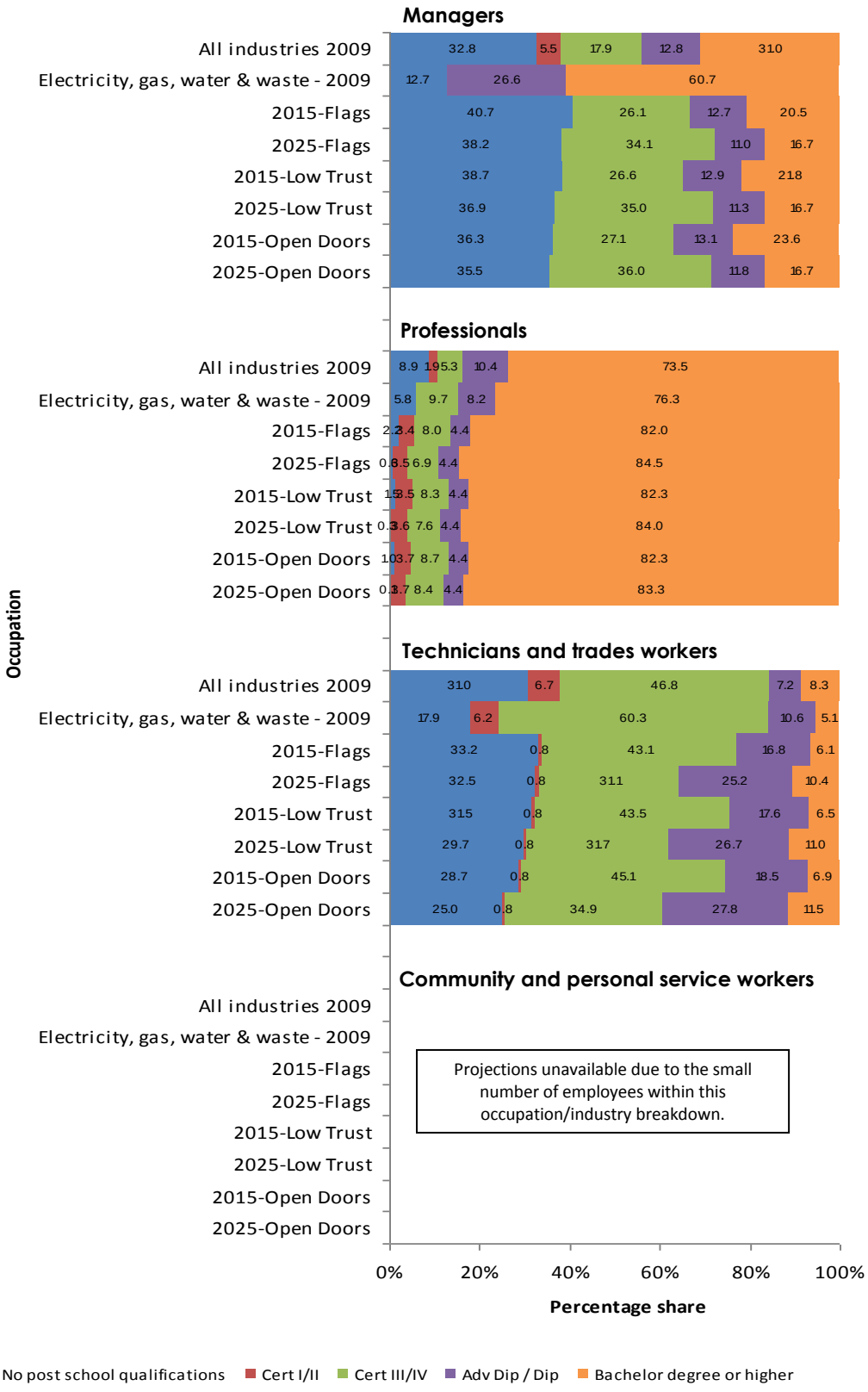
Source: DEEWR (2010) *Australian Jobs 2010*.

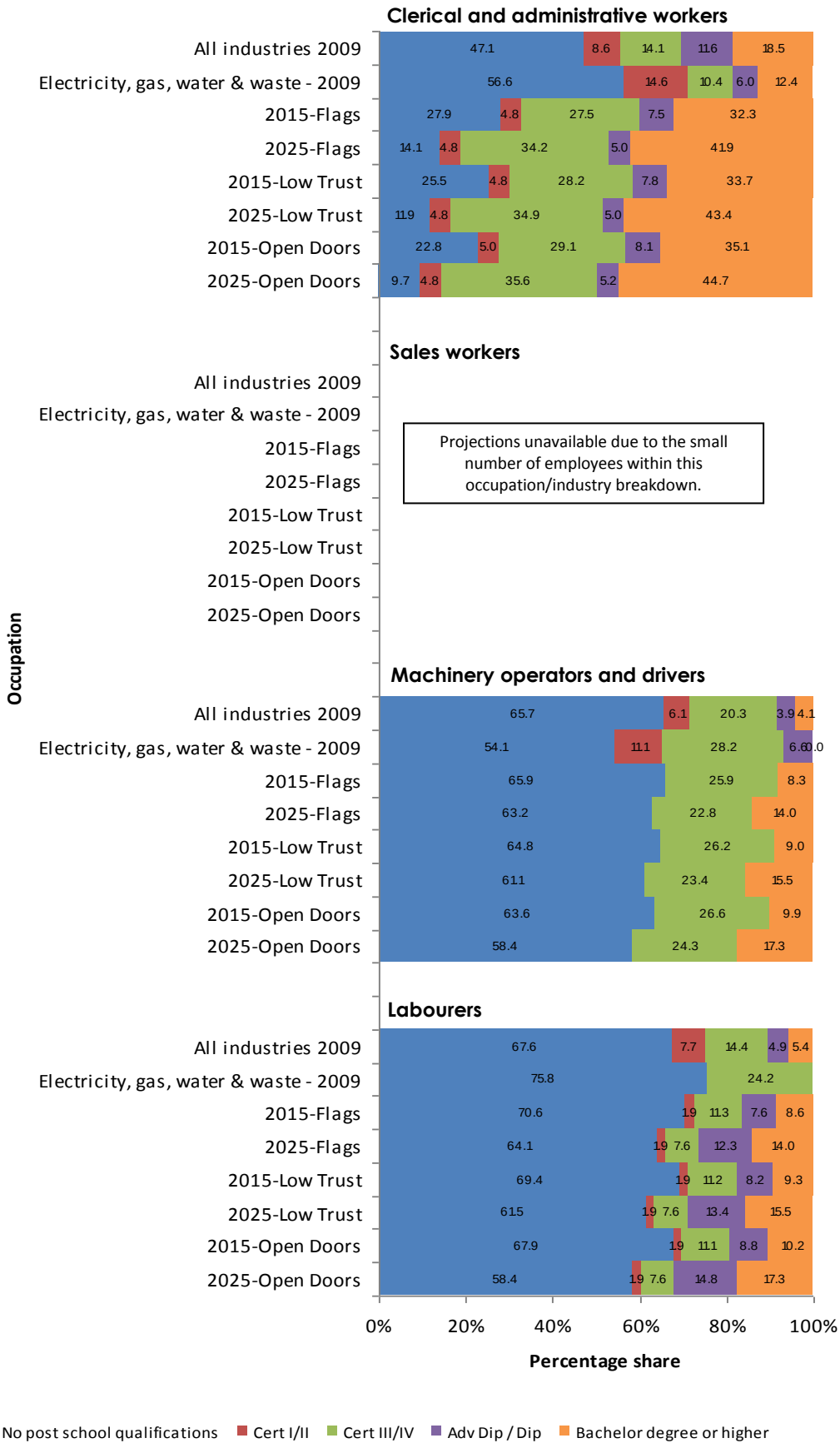
Figure 2 shows how demand for qualifications is expected to change over time. It shows the current education profile for each respective occupation: across all industries and within the electricity, gas, water and waste services industry. It also shows projected levels of educational attainment to 2015 and 2025 by each occupation group depending on which of the three scenarios eventuates.

The number of managers in the electricity, gas, water and waste services industry is expected to increase by about 7,900 workers in the period to 2025 under the Open Doors scenario, which accounts for the increase in the proportion of managers with no post school qualifications. This trend is also reflected, to a lesser extent, among technical and trades workers.

Conversely, there is a high degree of upskilling among clerical and administrative workers. The proportion with a Bachelor degree or higher is expected to increase from 12.4 to 44.7 per cent under the Open Doors scenario to 2025, with those with a Certificate III/IV level qualification increasing from 10.4 to 35.6 per cent. Occupations with lower skill levels such as labourers and, machinery operators and drivers also show a degree of upskilling, with increases in the proportion of people with a Diploma level or higher qualification.

Figure 2 Level of educational attainment in the electricity, gas, water and waste services industry, by occupation, 2009 and projections to 2015 and 2025 (%)





Source: ABS (2009) *Survey of Education and Work 2009* (Cat. no. 6227.0).

Specialised occupations

In *Workforce Futures*, Skills Australia has proposed that national skills and workforce planning should focus on **specialised occupations**. Specialised occupations are defined as those 'where specialised skills, learned in formal education and training, are needed at entry level and where the impact of market failure is potentially significant for the economy and/or the community.'

Specialised occupations demonstrate these characteristics:

- long lead time—skills are highly specialised and require extended learning and preparation time over several years;
- high use—skills are deployed for the uses intended (i.e. good occupational 'fit');
- high risk—the disruption caused by the skills being in short supply is great, resulting either in bottlenecks in supply chains or imposing significant economic or community costs because an organisation cannot operate; and
- high information—the quality of information about the occupation is adequate to the task of assessing future demand and evaluating the first three criteria.

Specialised occupations associated with the electricity, gas, water and waste services industry include:

Engineering managers
Electrical engineers
Civil engineering professionals
Industrial, mechanical and production engineers
Other engineering professionals
Electricians
Electrical distribution trades workers
Metal fitters and machinists
Plumbers

More detailed information about specialised occupations is available in *Australian Workforce Futures: A National Workforce Development Strategy* at http://www.skillsaustralia.gov.au/PDFs_RTFs/WWF_strategy.pdf.

Example workforce development initiatives

Investment in workforce development has been shown to maximise people's capabilities, lift productivity and increase workforce participation. Employee satisfaction levels and engagement also increase when enterprises make better use of their employees' skills.[6] Current workforce development initiatives in electricity, gas, water and waste services include the following examples:

- The **Upskilling Existing Workers in Sustainability** initiative aims to upskill existing and suitably qualified Australian Electrotechnology industry workers in skills for a low-carbon, sustainable economy. This project supports individuals, enterprises and industry to build skills for sustainability through targeted training of existing workers in areas such as Photovoltaic Systems. Further information can be found at www.ee-oz.com.au.
- The **National Standards for Licensing Persons Performing High Risk Work Project** is conducted by the ElectroComms and Energy Utilities Industry Skills Council (EE-Oz). The project will develop and implement assessment instruments for turbine operation and reciprocating steam engine operation that have been classified as high risk work by SafeWork Australia. The project aims to populate the Safe Work Australia standard template for High Risk Licensing assessment. Further information can be found at www.ee-oz.com.au.
- The **Plumbing & Services Continuous Improvement Project** focuses on the environmental sustainability of plumbing waste. The project is an ongoing project addressing industry needs including changes in technology and work practices that will be incorporated into training. Further information can be found at www.cpsisc.com.au.

[6] Skills Australia (2010) *Australian Workforce Futures: A National Workforce Development Strategy.*