



International  
Labour  
Organization

# Skills for Green Jobs in **Australia**





# Skills for Green Jobs in **Australia**

Copyright © International Labour Organization 2018  
First published 2018

Publications of the International Labour Office enjoy copyright under Protocol 2 of the Universal Copyright Convention. Nevertheless, short excerpts from them may be reproduced without authorization, on condition that the source is indicated. For rights of reproduction or translation, application should be made to ILO Publications (Rights and Licensing), International Labour Office, CH-1211 Geneva 22, Switzerland, or by email: [rights@ilo.org](mailto:rights@ilo.org). The International Labour Office welcomes such applications.

Libraries, institutions and other users registered with a reproduction rights organization may make copies in accordance with the licences issued to them for this purpose. Visit [www.ifro.org](http://www.ifro.org) to find the reproduction rights organization in your country.

---

*Skills for Green Jobs in Australia*

ISBN 978-92-2-132905-3 (print)  
978-92-2-132906-0 (web pdf)

---

The designations employed in ILO publications, which are in conformity with United Nations practice, and the presentation of material therein do not imply the expression of any opinion whatsoever on the part of the International Labour Office concerning the legal status of any country, area or territory or of its authorities, or concerning the delimitation of its frontiers.

The responsibility for opinions expressed in signed articles, studies and other contributions rests solely with their authors, and publication does not constitute an endorsement by the International Labour Office of the opinions expressed in them.

Reference to names of firms and commercial products and processes does not imply their endorsement by the International Labour Office, and any failure to mention a particular firm, commercial product or process is not a sign of disapproval.

Information on ILO publications and digital products can be found at: [www.ilo.org/publns](http://www.ilo.org/publns).

# Table of Contents

|                                                                                                                           |     |
|---------------------------------------------------------------------------------------------------------------------------|-----|
| Abbreviations and Acronyms .....                                                                                          | v   |
| Abstract .....                                                                                                            | vi  |
| Acknowledgment.....                                                                                                       | vii |
| 1. Introduction – what happened to the Green Shoots of 2009? .....                                                        | 1   |
| 2. Major Economic and Labour Market Trends since 2009/10 .....                                                            | 5   |
| 2.1 Economic Growth .....                                                                                                 | 5   |
| 2.2 Employment and Labour Market Developments.....                                                                        | 6   |
| 3. Key Policies and Regulations.....                                                                                      | 11  |
| 3.1 Climate Change Policy.....                                                                                            | 11  |
| Rudd-Gillard-Rudd Labor Governments November 2007 – August 2013.....                                                      | 11  |
| Abbott – Turnbull Liberal Government September 2013 – present day.....                                                    | 12  |
| The Rise of Renewables? .....                                                                                             | 15  |
| 4. Work, Skills and Training .....                                                                                        | 17  |
| 4.1 Vocational Education and Green Skills .....                                                                           | 17  |
| The VET System in Australia .....                                                                                         | 18  |
| Creation of a ‘Training Market’ .....                                                                                     | 20  |
| 4.2 Active Labour Market Programmes.....                                                                                  | 21  |
| 4.3 Social care and green jobs.....                                                                                       | 22  |
| 4.4 What could VET and Training look like? .....                                                                          | 22  |
| 5. Analysis of case studies.....                                                                                          | 23  |
| 6. Conclusions and recommendations .....                                                                                  | 25  |
| 7. References.....                                                                                                        | 27  |
| 8. List of key resource persons .....                                                                                     | 31  |
| 9. Annex .....                                                                                                            | 33  |
| Case Study I. The Home Insulation Program (HIP) .....                                                                     | 33  |
| Case Study II. The ‘Green Army’ .....                                                                                     | 34  |
| Case Study III. Effects of Policy Malaise.....                                                                            | 35  |
| Case Study IV. Towards low-carbon electricity generation – Retiring Coal .....                                            | 36  |
| Case Study V. Corporate Steps to a new green and inclusive business model.....                                            | 37  |
| Case Study VI. Gippsland Solar – Leader in a rapidly evolving business .....                                              | 40  |
| Case Study VII. Delivering solar electricity to low-income residents: Stucco<br>Housing Cooperative and Sun Tenants ..... | 41  |
| Case Study VIII. Indigenous green skills: Warddeken Indigenous<br>Protected Area, Northern Territory.....                 | 41  |

|                                                                                                |    |
|------------------------------------------------------------------------------------------------|----|
| Case Study IX. Carbon Neutrality, a skills challenge? .....                                    | 42 |
| Case Study X. Sustainable Water Management – Australia's Murray Darling River Basin Plan ..... | 43 |
| Case Study XI. Environment Institute of Australia and New Zealand – Learning to Adapt .....    | 44 |
| Case Study XII. Green Skills and Bushlink – People Living Disabilities.....                    | 45 |

## List of Charts

|                                                                                          |   |
|------------------------------------------------------------------------------------------|---|
| <b>Chart 1.</b> GDP Growth in select economies 2009-2016                                 | 5 |
| <b>Chart 2.</b> GDP Growth Australia and selected Australian States 2009-2016            | 6 |
| <b>Chart 3.</b> Wage profit share in Australia 1960-2016                                 | 7 |
| <b>Chart 4.</b> Employment in Australia, total employment and by gender 2009-2017        | 7 |
| <b>Chart 5.</b> Unemployment in Australia, unemployment in total and by gender 2009-2017 | 8 |
| <b>Chart 6.</b> Employment in Australia, full-time employment by gender 2009-2017        | 8 |
| <b>Chart 7.</b> Employment in Australia, part-time by gender 2009-2017                   | 9 |
| <b>Chart 8.</b> Unemployment in the OECD, Australia versus OECD average 2009-2017        | 9 |

# Abbreviations and Acronyms

|                 |                                                            |
|-----------------|------------------------------------------------------------|
| <b>ACCI</b>     | Australian Chamber of Commerce and Industry                |
| <b>ACTU</b>     | Australian Council of Trade Unions                         |
| <b>ALMP</b>     | Active Labour Market Programme                             |
| <b>AMEC</b>     | Australian Energy Market Commission                        |
| <b>AMWU</b>     | Australian Manufacturing Workers Union                     |
| <b>CBT</b>      | Competency Based Training                                  |
| <b>CEFC</b>     | Clean Energy Finance Corporation                           |
| <b>CEPU</b>     | Communications Electrical and Plumbing Union               |
| <b>CET</b>      | Clean Energy Target                                        |
| <b>COAG</b>     | Council of Australian Governments                          |
| <b>CPOW</b>     | Centre for People Organisation and Work                    |
| <b>CSG</b>      | coal seam gas                                              |
| <b>CSIRO</b>    | Commonwealth Science, Innovation and Research Organisation |
| <b>DGR</b>      | deductible gift recipient                                  |
| <b>ERF</b>      | Emissions Reduction Fund                                   |
| <b>ETS</b>      | Emissions Trading Scheme                                   |
| <b>GFC</b>      | Global Financial Crisis                                    |
| <b>GSA</b>      | Green Skills Agreement                                     |
| <b>IPA</b>      | Institute of Public Affairs                                |
| <b>LPG</b>      | Liquid Petroleum Gas                                       |
| <b>NCVER</b>    | National Centre for Vocational Education Research          |
| <b>NDIS</b>     | National Disability Insurance Scheme                       |
| <b>PM&amp;C</b> | Prime Minister and Cabinet                                 |
| <b>PV</b>       | photovoltaic                                               |
| <b>RTO</b>      | Registered Training Organisation                           |
| <b>TAFE</b>     | Technical and Further Education                            |
| <b>VET</b>      | vocational education and training                          |

# Abstract

Australia is a high carbon emissions country on a per capita basis, with an imposing challenge of transitioning to a low carbon economy. But the move towards a 'green' economy and a 'green' workforce with decent work has become more contested since the last ILO country report in 2009. Following many individual disparate regional and State initiatives, a set of promising steps at national level in the 2000s seemed to indicate that Australia may be moving to establish the basis for a low-carbon economy and the training and labour market support necessary for a re composition of the workforce. At the time of the 2009 country report, signs of 'green shoots' could be readily identified in Australian climate and skills policy. After 2009, however, climate policy at national level has been characterised by bitter and seemingly intractable debate. One outcome is that there has been a lack of policy clarity and certitude, with the result that investment in renewables and even new energy generation capacity has suffered. In addition, the increasing privatisation of training and learning arrangements has removed clarity in relation to the scope and scale of support for the promotion of 'green' skills. This presents an obvious challenge to the capacity for greening the economy to deliver inclusive growth. While distinctive policies on Vocational Education and Training and green jobs were promulgated in the 2009–2012 period, since then there have been no major developments in Green Skills Training. Green Skills Policy was largely developed within the context of the previous Labor Government's (2007-2013) climate commitments. The peak bodies of the major social partners, such as the ACTU or ACCI, have not developed major plans for action on climate change, and the burden of advocacy around climate change has shifted away from those traditional social partners to individual enterprises, social movement groups, and regional organizations.

Nevertheless, even without policy certainty and development, or strong leadership from the traditional social partners, previously instituted policy in areas such as more energy-efficient housing (building codes) are creating demands for embedding green skills in many building trades. Furthermore some corporations have begun to take steps towards moving out of coal-fired energy generation and shifting towards renewables ahead of government policy mandating the latter. Many corporations have begun to produce climate impact reports. Some State governments (Victoria, South Australia and Queensland) have moved to adopt their own emission reduction targets, and several city councils have also begun to take action to manage emissions. Promisingly, high consumer demand for rooftop solar panels for residential energy generation has continued, which - along with the rapid take-up of battery storage - suggests that there is broad support for more action on climate change. Finally, there is some evidence of a renewed bottom-up process of skills development. There are two features to this process: first, a range of seemingly ad hoc activities related to skills development has been initiated; and second, a broader assortment of social actors are engaging with the implications of climate change in ways that matter for 'green' jobs and decent work.

# Acknowledgment

This study was conducted by Huon Curtis, Nigel Douglas, Peter Fairbrother, Kate Grosser, Val Propokiv, Michael Rafferty, Philip Toner, as a part of set of national studies on skills for green jobs conducted in some thirty countries globally. The set of studies is the result of collaboration between the ILO and the European Centre for the Development of Vocational Training (Cedefop). Overall methodological guidance was provided by Olga Strietska-Ilina (ILO Employment Policy Department, Skills and Employability Branch). Coordination of country studies and technical backstopping was provided by a team led by Catherine Saget (ILO Research Department), Tahmina Mahmud (ILO Skills and Employability Branch) and Takaaki Kizu (ILO Research Department). Moustapha Kamal Gueye and Marek Harsdorff (ILO Enterprises Department) contributed to the studies' implementation on behalf of the ILO Green Jobs Programme. Alena Zukersteinova and Stelina Chatzichristou from Cedefop's Department for Skills and Labour Market coordinated studies among the participating EU countries. Valuable inputs were provided by the ILO colleagues: Christine Hoffmann, Laura Brewer, Maria Ilca Lima Webster, Alvaro Ramirez Bogantes, Hassan Ndahi, Fernando Vargas Zuñiga, Patrick Daru, Akiko Sakamoto, Mikhail Pouchkin, Gabriel Bordado, Julien Magnat, Kanae Tada, Tendy Gunawan, Bolotbek Orokov, Gwyneth Anne Palmos, Georginia Pascual, Badiane Cheickh and Kishore Kumar Singh. Massimiliano Leone, Ana Buzdugan (International Training Centre ILO Turin), Mariela Dyrberg and Annette Brandstätter (ILO Employment Policy Department), Solveig Boyer (ILO Green Jobs Programme) and Manuela Flamini (Edizioni Retrò s.r.l.) were responsible for editing and design.



# 1. Introduction – what happened to the Green Shoots of 2009?

The purpose of this report is to outline the major changes in climate and skills policy, as well as in the economy and employment, following a 2009 review of climate policy and skills developments (Rafferty and Yu 2009).<sup>1</sup> The 2009 report was part of a multi-country study conducted under the auspices of the International Labour Organization (ILO 2011). The 2009 study was tasked with reporting on the challenges of adjusting to a lower-carbon economy in three key areas:

- Mitigating displacement in industries and occupations likely to become obsolete;
- Supporting the emergence of new, green jobs; and
- Assisting with the ‘greening’ of existing jobs.

The current report focuses on key policy and regulatory changes in climate policy and the relevant skills development measures for the green economy since that time. It also draws conclusions and policy recommendations for skills policy and strategies to meet the demand for greening the economy (ILO 2017). The current report was carried out by researchers from the Centre for People Organisation and Work (CPOW) at RMIT University.

Rafferty and Yu (2009) analysed developments by governments, employers and trade unions (the ‘social partners’) in Australia to promote environmentally sustainable jobs in an increasingly climate-constrained world. At the time of the last country report, climate policy had emerged as a significant political and policy issue in Australia. Steps towards addressing the challenges of carbon abatement and of the need to prepare citizens, workers and industry for a low-carbon economy were evident. Nonetheless Australia was and remains a high carbon

emission country on a *per capita* basis, with a dependence on fossil fuels (especially coal), an inefficient housing stock and a very small renewable energy sector. In 2009 there was some tangible hope that climate change policy, along with skills and training initiatives, was evolving to tackle the carbon-intensity of Australia’s economy. Even so, the report noted that progress up until to that time was marked by “...a lack of coherent and nationally co-ordinated climate change policy agendas” (Rafferty and Yu 2009: 8).

The 2009 country report noted that there had been a proliferation of responses at State, regional and community levels. These responses had produced some innovative but fragmented initiatives targeting emission reductions, improved energy-efficiency, skills and training, and promotion of renewable energy. The Rudd Labor Government (2007-10) had however just ratified the Kyoto protocol and had begun discussing carbon pollution reduction targets, energy-efficiency initiatives and renewable energy targets. There was also a growing recognition of the skills and labour market initiatives that might support these policies, and these were reflected in more explicit recognition of the skills challenges in education and training initiatives. The country report noted, with cautious optimism, that there were signs of ‘green shoots’ in climate and green skills policy in Australia. However the report concluded that that climate change was also becoming the subject of considerable political debate and therefore that the transition to a lower-carbon economy remained delicately poised.

Some of the key findings of Rafferty and Yu (2009) included the following:

- Australia is a relatively emissions-intensive economy, with the highest emissions *per capita* in the OECD. This energy consumption profile presented both challenges for adjustment (for instance around phasing-out emissions-intensive coal-fired power stations), and opportunities for abatement (around the

<sup>1</sup> The authors would like to thank Peter Glynn for advice and feedback in preparing this report, as well as an anonymous reviewer for detailed and constructive feedback on an earlier version of this report. The views expressed here are solely those of the authors, and the usual caveat about any remaining errors or omissions applies.

use of existing energy-efficient technologies and practices, as well as introducing renewable energy options);

- Australia was the eighth largest player in the world energy market, and was a large exporter of coal, uranium and LPG;
- Australian production of energy was dominated by coal (around 40 per cent of the fuel mix), while renewable energy production was very small (around two per cent);
- Demand for energy in Australia was dominated by the manufacturing, transport and residential sectors;
- The energy-efficiency of the residential building stock was notably poor, and improvement in the energy-efficiency of existing and new buildings was seen as a significant opportunity for reducing per capita carbon emissions (Rafferty and Yu 2009).

The report also found that climate and energy policy was partially, although not yet clearly, transitioning towards a more explicit imperative to tackle the threat of climate change. Some progress had been made to meet international climate change agreements and several domestic developments suggested promise of a regulatory regime switch towards a low-carbon economy. But, to use a sporting analogy, the trajectory of climate change policy was at the halfway mark with “everything still to play for”, and consequently predicting likely future outcomes was not easy.

Over the last eight years, climate policy in Australia has become increasingly politically contentious and policy development at national level has slowed. Australian public policy in general, but climate change and skills policies in particular, has suffered from political paralysis and a series of setbacks. Not only have many planned initiatives not taken place, but some policy regression can be observed. In some ways, this can be linked to developments such as growing political and economic inequality, which is seeing the political centre shrinking. In part also, policy paralysis in Australia can be linked to the growing policy activism by powerful industry lobby groups. This has, of course, made planning and investing in energy-efficiency and

low-carbon activities, including their skills and training needs, quite daunting.

In some ways, also, the last eight years can be seen within the longer-term history of climate policy in Australia, which has lacked a coherent vision and has failed to find a sustained political consensus for change. As one review noted:

*“Australia’s commitment to climate action over the past three decades could be seen as inconsistent and lacking in direction. At times Australia has been an early adopter, establishing the world’s first government agency dedicated to reducing greenhouse gas emissions; signing on to global climate treaties the same day they are created; establishing the world’s first emissions trading scheme (ETS) (albeit at a state level); and pioneering an innovative land-based carbon offset scheme. But at other times, and for many reasons, Australia has erratically altered course: disbanding the climate change government agency, creating a new one then disbanding that; refusing to ratify global treaties until the dying minute; and introducing legislation to repeal the national ETS.” (Talberg et.al. 2016: 1).*

It is perhaps understandable from the longer-term trajectory of climate policy described above that a coherent and developmental green skills and labour market policy has been difficult to sustain.

This report advances two specific arguments. First, Australia is still finding its way toward a coherent and integrated low-carbon policy that can inform corporate policy and promote green skills development. However, even in the absence of such a policy framework we do find several interesting initiatives at different levels and in different sectors. Giving greater recognition of these local, regional and sectoral initiatives is probably just as important as seeking greater national leadership on the issues. In an increasingly divided national political scene, these ‘transformations from below’ are indeed part of Australia’s longer-term democratic history. Second, the key social partners that in the past were understood to be crucial to skills development and labour markets (employers

and trade unions) have not been strong or sustained advocates of action on climate change and the skills implications of such a transition. In part this is because of contending interests within these groups, and in part because of the limited available resources for tackling a growing range of contemporary social and environmental issues facing these social partners. In the absence of these traditional social partners, other social actors have begun to experiment and innovate around climate change abatement and green skills. Understanding the trajectory toward, and possibilities for, inclusive and sustainable growth in Australia might therefore require expansion of the concept of social partners. The Report recommends that, at least in the case of Australia, the range of social partners needs to be understood in a broader context than merely governments, employers and unions (exemplified in Case Studies VIII and IX).



## 2. Major Economic and Labour Market Trends since 2009/10

In 2009, the global economy was confronted with the aftermath of a financial crisis that started in the sub-prime mortgage market in the United States but quickly escalated to global proportions (Bryan and Rafferty, 2011; Bryan, 2010). In Australia, partly because of its exposure to Chinese industrialisation and especially the Chinese government's post-Crisis stimulatory infrastructure spending, as well as concerted Australian government monetary and fiscal policy action, economic activity - and therefore the potential social dislocation caused by the global financial crisis (GFC) was largely avoided. This is certainly evident as compared to the situation in many similarly-placed developed economies (Bryan *et al.*, 2017). Indeed, the period after 2009 was a time of commodity price and a demand-induced investment and construction boom. Fiscal and monetary policy was also deployed in a systematic manner, which underpinned a construction and consumption uplift.

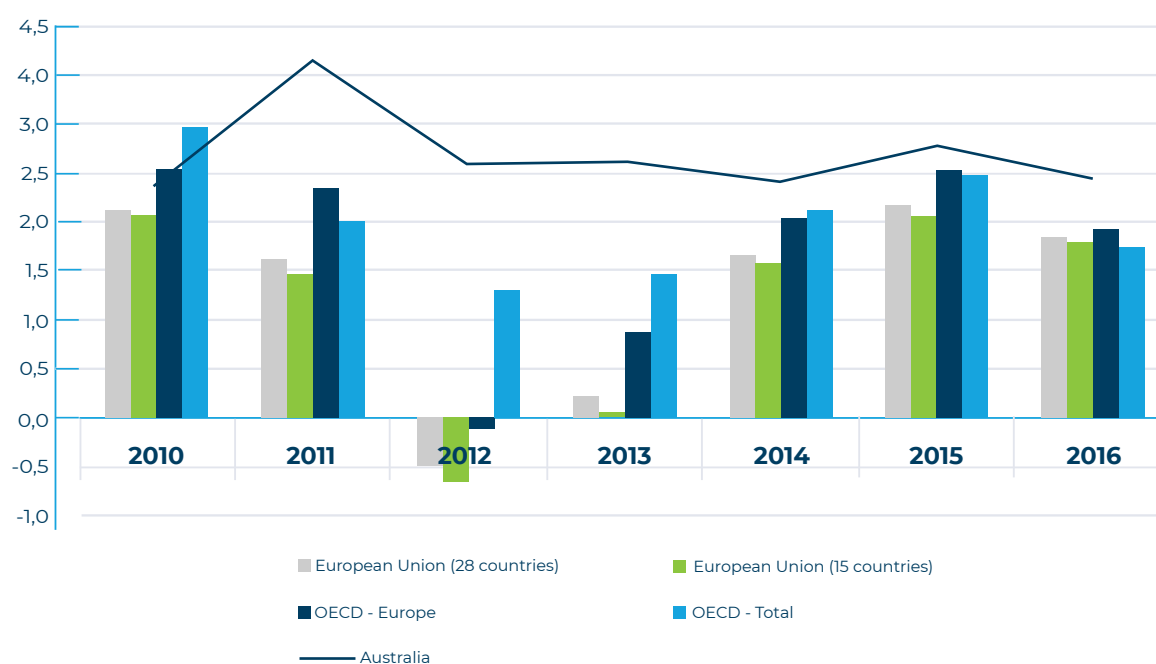
### 2.1 Economic Growth

Since 2009, sustained Australian economic growth can be noted. Chart 1 below shows the pattern of economic growth in the period since 2009, and compared to other OECD countries or those in Europe, we can see robust economic growth in Australia.

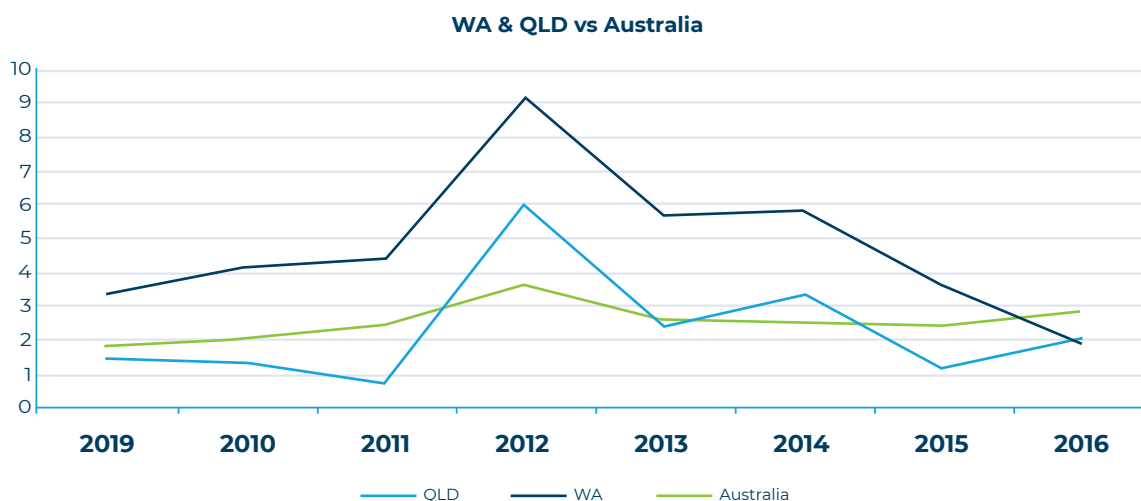
Not only did Australia avoid the worst economic and social effects of the GFC, in some Australian regions - especially the mining regions in Queensland and Western Australia - there was in fact a short-lived resources mini-boom. The regional patterns of the growth can be seen in Chart 2.

Nevertheless, the problem of inclusive growth remains stark in Australia. Chart 3 shows that in terms of income inequality, the profit share of national income in Australia hovers around historic highs.

**Chart 1.** GDP Growth in select economies 2009-2016



Source: OECD 2017.

**Chart 2.** GDP Growth Australia and selected Australian States 2009-2016

Source: ABS 2017.

## 2.2 Employment and Labour Market Developments

In terms of skills and labour market developments, we can observe several important trends. The first is that in Australia the sharp and significant rise in post-GFC unemployment that occurred in many other OECD countries was avoided. Chart 4 shows the growth in employment and unemployment over the period. It shows that there has been a steady growth in total employment for both genders. This contrasts with the experience of many other OECD countries in the wake of the GFC (see Chart 8).

Indeed, in many regions of Australia significant labour and skills shortages were experienced and large inward migration continued to play a role in mediating these tensions. Chart 5 shows that indeed there was a decline in unemployment between 2009 and 2012, thanks to a large stimulus package and monetary policy easing, as well as the effects of demand relating to Chinese infrastructure spending.

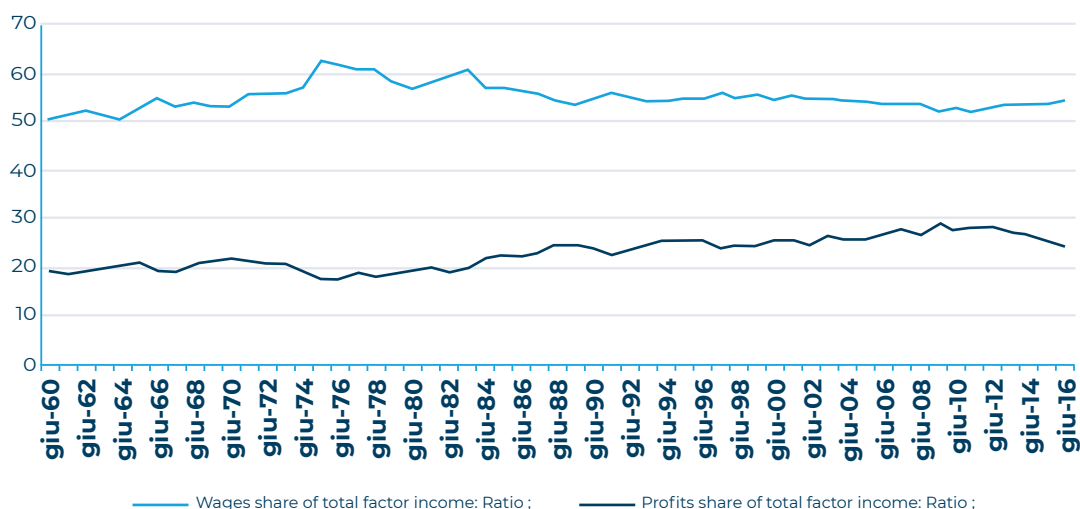
In terms of inclusive growth we can note that the gender pattern of employment change has continued to support female full-time employment and male part-time employment.

This pattern of growth has seen instances of, but by no means any general trend, of closing the gender pay gap. To illustrate, Australia Post has successfully closed its workforce gender gap, having embarked on a seven-and-a-half year project to address the representation of women at all leadership levels and to address unconscious bias against the employment of women. Chart 6 shows a growth in both male and female full-time employment over the period. What these figures do not show, however, is that industrial relations policy (currently the Fair Work Act) has increasingly favoured employers over workers, so that real wages have not increased since 2011, and for instance full-time employment no longer guarantees a living wage (requiring more households to have multiple jobs or income earners) and provides less job security and associated employment rights.<sup>2</sup>

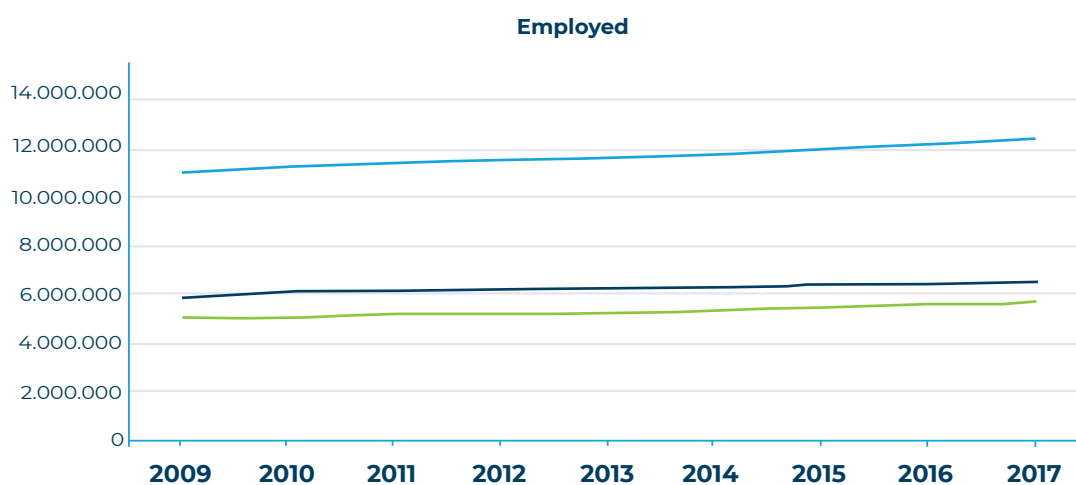
Chart 7 also shows that the rate of growth of part-time employment has exceeded that of full-time employment and Australia now has more than 30 per cent of the workforce in part-time employment, one of the highest proportions in the OECD. Females still dominate

<sup>2</sup> One economic research service, estimates that a living wage in Australia for a family currently \$855 per week, while the minimum wage is \$694.90. (<https://tradingeconomics.com/australia/living-wage-individual>).

## Skills for Green Jobs in Australia

**Chart 3.** Wage profit share in Australia 1960-2016

Source: ABS 2017.

**Chart 4.** Employment in Australia, total employment and by gender 2009-2017

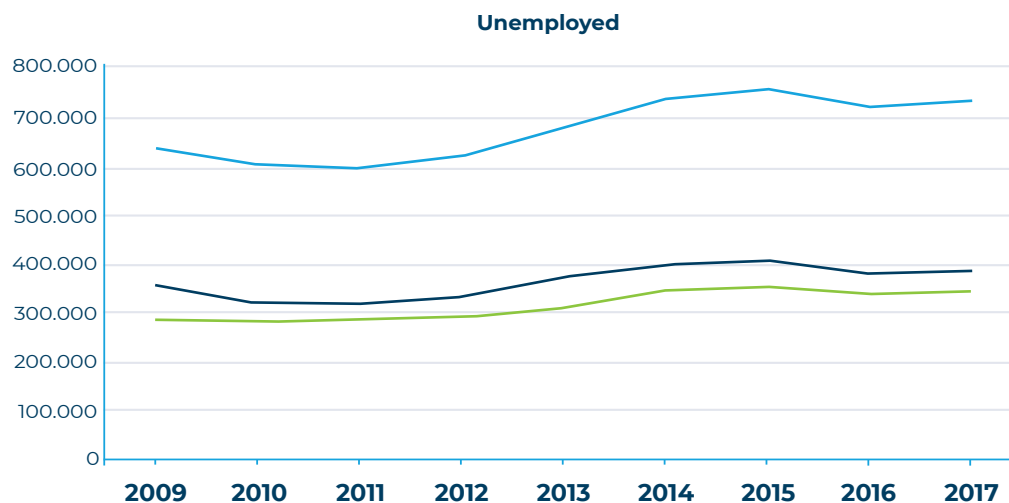
Source: ABS 2017, average employment across year.

part-time employment, but one can also note steady increasing male part-time employment. Survey data shows that a large number of part-time employees (around a quarter of all part-time workers) would prefer to work more hours to enable them to meet household expenses.

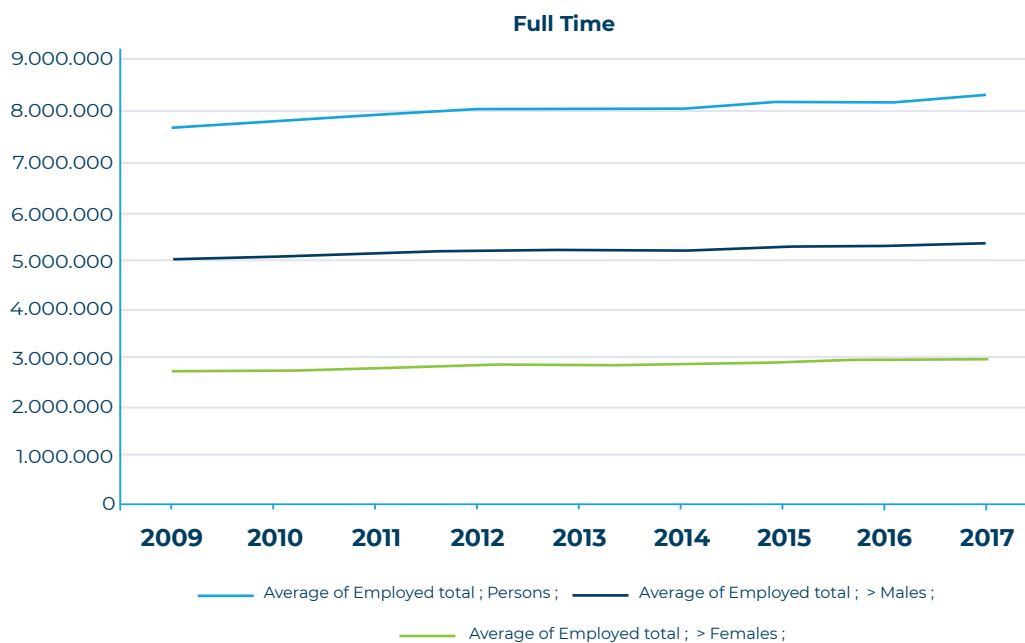
Chart 8 shows that as a consequence of job growth the Australian economy was able to maintain quite low levels of unemployment throughout the period

2009-2016 compared to other developed countries. Unemployment was consistently lower in Australia during that period, despite tracking fairly closely to the OECD average before that time, and despite running a very active immigration policy.

Indeed, compared to the countries most badly-affected by the GFC in Europe (Portugal, Ireland, Greece and Spain), the unemployment trend in Australia has been quite remarkable (Chart 8).

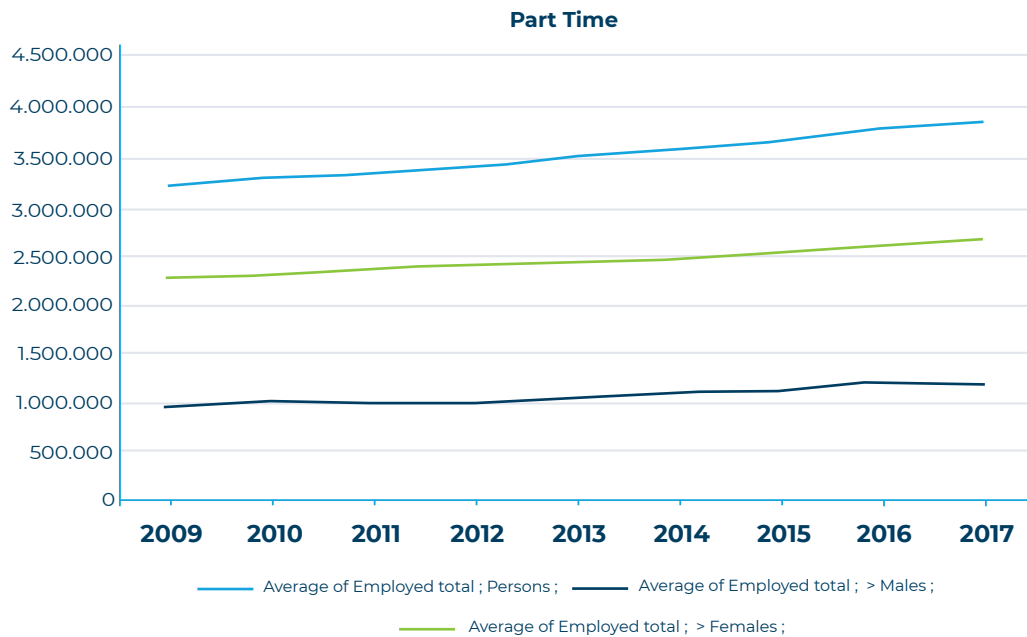
**Chart 5.** Unemployment in Australia, unemployment in total and by gender 2009-2017

Source: ABS 2017, average unemployment across year.

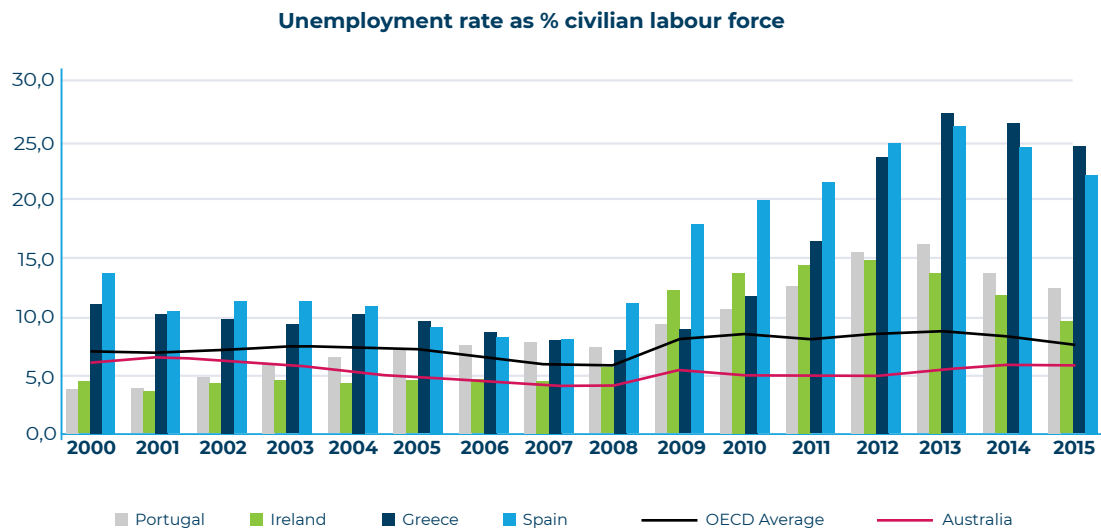
**Chart 6.** Employment in Australia, full-time employment by gender 2009-2017

Source: ABS 2017, average across the year.

## Skills for Green Jobs in Australia

**Chart 7.** Employment in Australia, part-time by gender 2009-2017

Source: ABS 2017.

**Chart 8.** Unemployment in the OECD, Australia versus OECD average 2009-2017

Source: OECD 2017.



## 3. Key Policies and Regulations

### 3.1 Climate Change Policy

As the earlier Country Report noted, climate change featured prominently in the 2007 federal election campaign, with the then Labor opposition leader Kevin Rudd referring to climate change abatement as, 'the great moral challenge of our generation' (Rudd 2007). While that election has been referred to as Australia's first climate change election (Rootes 2008), it is clearer, especially in retrospect, that the 'moral imperative' of climate change was largely a rhetorical flourish. Climate policy action was not sustained at a national political and policy level.

#### Rudd-Gillard-Rudd Labor Governments November 2007 – August 2013<sup>3</sup>

After its election campaign in 2007, the incoming Rudd Labor government ratified the Kyoto Protocol and made some early moves on climate change, including the establishment of a Department of Climate Change and Water, a proposed Carbon Pollution Reduction Scheme, legislation for an Emissions Trading Scheme, and a target to reduce emissions by 2020 by 25 per cent from 2000 levels.

But the policy developments were often poorly designed and implemented (see Case Study I – the Home Insulation Program), or poorly negotiated. For instance, the Home Insulation project was rushed to help provide employment as part of the government's stimulus package, but it meant poorly trained young workers were put into the roofs of residential houses by many start up firms with no experience, and these workers were exposed to the dangers of faulty wiring and extreme heat, resulting in several deaths. It also showed the necessity of mainstreaming green skills training and associated licensing.

It is also important to report that climate policy became increasingly driven by interest groups and ideological debate, so that powerful interest groups have been able to block and even roll back action on climate change. Along with moves by interest groups to block climate change initiatives, opposition to action on climate change increasingly began to find a potent political and media voice, notably in right wing media outlets.

With the election of the openly climate-sceptic, Tony Abbott, as leader of the Liberal Opposition in December 2009, political bipartisanship on climate policy dissolved, and climate policy became an arena for increasing policy polarisation. The Opposition leader dubbed a proposed Emissions Trading Scheme (ETS) as a 'carbon tax', and action to promote renewable energy described as wasteful 'subsidies'. With the end of bipartisanship, legislative initiatives on climate change (such as the ETS) stalled and became delayed. Nonetheless, with the election of Julia Gillard as Prime Minister in June 2010, and following the re-election of a minority Labor government in September of that year, an agreement was struck with the Australian Greens political party to work towards establishing a price on carbon by 2020.

A raft of policies were introduced by a minority Labor government over the following 18 months:

- In November 2011 a Clean Energy Act was passed that provided a framework for an ETS, starting with a three-year fixed price;
- In June 2012 a \$10 billion Clean Energy Finance Corporation was established and a price on carbon came into effect, starting at \$23;
- In July 2012 a Climate Change Authority was established as an independent advisory body on climate change;
- In December 2012 a Renewable Energy target was released;

<sup>3</sup> The information for this section is sourced from Talberg et. al. (2016) and Talberg and Workman (2016).

- In March 2013 the Department of Climate Change was disbanded and its functions moved to a larger multi-function department, linking environmental and industry functions;
- In June 2013, Kevin Rudd took over as Prime Minister.

While some convergence remained between the major political parties on carbon-offset policy (especially land-based carbon sequestration), divergence on energy policy and environmental protection laws increased (Pearse 2016). The Coalition and ALP both support 'market-based' emissions trading and carbon-offset programmes. The Coalition's version was a 'Direct Action' plan while the ALP continued to support an a market-based ETS.

The outcomes posed a conundrum. On the one hand political parties began to lose credibility among the electorate across the policy spectrum. To illustrate, the Climate Institute released pre-election polling in 2016 which revealed low confidence in the major parties' plans for addressing climate change (17 per cent for Coalition and 20 per cent for ALP). On the other hand, renewable technologies were consistently popular, and households increased their use of renewable energy (especially roof-top solar) (TCI 2014, 2016). Increasingly, coal seam gas (CSG) became an issue in State elections as compared with the Federal Elections (the 2015 NSW election saw Ballina, an historically national seat, fall to the Green Party). In particular, the conservative NSW Baird Government approached the State elections in 2015 promising to limit CSG exploration.

### Abbott – Turnbull Liberal Government September 2013 – present day

The push to slow and even reverse some moves towards a low-carbon economy took a sharper turn with the election of conservative governments in 2013. The Liberal-National Coalition went to the 2013 election with the intention of abolishing the Rudd-Gillard (2007-2013) Labor government's 'carbon tax', suspending the operation of the Clean Energy Finance Corporation (CEFC) and cutting

'green tape.' Following the election the Abbott Coalition government took the following steps:

- It decreased the ambitions of the Renewable Energy Target (RET), repealing it in 2015);
- In 2013 it dissolved the Department of Climate Change, initiated under the Rudd Government in 2010;
- In 2014 it repealed the 'Carbon Tax' introduced in 2011;
- It wound down or discontinued government incentives that encouraged the uptake of household solar photovoltaic (PV) technology;
- It abolished the Climate Commission advisory body;
- It proposed that the Department of Prime Minister and Cabinet (PM&C) investigate the Bureau of Meteorology for 'exaggerating' global warming.

The powerful mining industry lobby group, the Minerals Council of Australia, which has two of the largest global mining conglomerates, BHP Billiton and Rio as key members, began an active programme of lobbying political parties both to resist action on climate change and to marginalise civil society actors that challenged mining interests around coal and climate change. This included both media campaigns to promote the image of coal and mining, and political lobbying to take away the charity status of environmental and social change campaigning groups. The pro-coal lobby was successful enough to have Tony Abbott claim in 2014 that coal is "good for humanity", as well as members of parliament bringing coal into parliament house to demonstrate their support for coal.

In the context of global moves to encourage new multi-stakeholder governance of environmental issues, involving government, business and civil society organizations, it is important to note that the government in Australia has been waging a multifaceted campaign to reduce the influence of environmental charities, by stripping them of their funding basis. A new 'review' of tax arrangements for non-governmental organizations singles out environmental organizations for particular scrutiny. Almost every larger environmental

organization, and certainly all that employ staff, rely on holding 'deductible gift recipient' (DGR) status. To have DGR status a group must be registered as a charity, and either be listed on the Register of Environmental Organisations or inscribed in the Taxation Act. This allows them to collect tax-deductible donations from the public and is necessary before philanthropic organizations can give them funds. Removing DGR status of an organization thus effectively cuts the vast majority of its funding. In particular, environment organizations are likely to be required to disclose how donations are spent, with a cap imposed on advocacy work, and moves are afoot to restrict overseas funding and ban electoral campaigning if such funds are received. Environmental organizations should, according to the government, concentrate on cleaning up environmental messes rather than lobbying to prevent them happening. The deputy programme director at Greenpeace, Susannah Compton, attacked the proposal as an attempt to "turn environmental advocates into a clean-up crew for fossil fuel companies and the government".

According to Friends of the Earth, the call for green groups to have their DGR status stripped has been promoted by a range of actors within the mining and fossil fuel sectors. The Age newspaper reported that **«it was the mining industry and its representative lobby groups, such as the Minerals Council, which months ago began calling for donations to environmental organizations to no longer be tax deductible»**. Moreover, the far-right Institute of Public Affairs (IPA) is itself a 'deductible gift recipient' (DGR) listed 'think tank', which has been crafting much of the campaign to try and remove the DGR status from environmental organizations. Unlike green groups, the IPA is lacking in transparency when it comes to providing details of its income sources, although it was recently revealed that Australia's richest person, mining rentier, Gina Rinehart has been the IPA's largest donor. The extreme pro-coal stance of the Minerals Council has started to divide members. In November 2017, BHP Billiton announced that it would no longer continue to support the Minerals Council's attempts to change the charitable status of environmental

groups and Rio has similarly subsequently announced that it would distance itself from the Minerals Council.

Nevertheless, the conservative Abbott Government proceeded to dismantle four climate change programmes. First, it moved climate change functions to the Department of Environment. Second, it promoted research on the medical effects of wind farms (which reported in February 2015 that there is no evidence that wind farms cause adverse health effects). Third, in November 2013 the government introduced legislation to repeal ETS, CCA and CEFC, but the Bills stalled in the Senate. Fourth, the government began its Direct Action plan involving incentives in the form of direct payments to polluters to reduce their emissions. These payments were coordinated through the \$2.55 billion Emissions Reduction Fund (ERF). For example, cattle farmers could apply for payments for emissions reductions from pasture-fed beef cattle. Farmers could choose management practices such as establishing higher-quality pasture or providing a feed supplement to cattle in order to improve the quality of feed, which reduces methane generation from digestion of feed. The Direct Action legislation contains a 'safeguard mechanism' which was due to commence July 2015. This safeguard mechanism caps the emissions of the 150 companies that account for approximately 50 per cent of Australia's carbon emissions. If those companies exceed certain emissions levels, they are required to purchase carbon credits (Parliament of Australia 2013). A raft of sometimes contradictory measures to related to climate change as a major challenge followed:

- December 2013 – Government approves a large new export coal-mine in Galilee Basin;
- April 2014 – Government announces staffing cuts of 250 in the Environment Department;
- Australia's chief climate change research institution, the CSIRO, is pressured in February 2016 by the Government to redistribute its human resources away from ocean and atmospheric research. This move brought considerable international condemnation;
- July 2014 – Government approves two new large export coal-mines;

- December 2014 – a CCA review recommends against scaling back of the Renewable Energy Target (RET) of 41,000GWh;
- March 2015 – Government proposes a revised RET of 31,000GWt, but this is rejected by the Opposition;
- April 2015 – the Clean Energy regulator holds a first ERF auction with 107 contracts awarded for \$660 million covering 46Mt of abatement at an average price of \$13.95 per tonne;
- May 2015 – Government reached agreement with the Opposition to reduce RET from 41,000 GWt to 33,000 GWt by 2020;
- June 2015 – Government report on end-use energy intensity in Australia finds that although energy intensity has decreased in the economy since the 1980s, it has been offset by increased energy consumption in the mining sector;
- June 2015 – Climate Roundtable, an alliance of industry and environment groups, issues a joint principle for climate policy, calling for effective, broad and internationally-linked action;
- August 2015 – Australia's post-2020 emission reduction target and associated strategies were announced. This was submitted to the United Nations negotiations in Paris. Australia's Intended Nationally Determined Contribution to a new Climate Change Agreement implements an economy-wide target of reducing greenhouse gas emissions by 26-28 per cent below 2005 levels by 2030;
- This announcement included a commitment to develop a *National Climate Resilience and Adaptation Strategy*.

The Abbott Government's (2013-2015) favoured approach to green skills was a welfare-to-work programme entitled the 'Green Army', which began in 2014 but was discontinued in 2016 (Case Study II).

In September 2015, Malcolm Turnbull replaced Tony Abbott as Prime Minister, and reshuffled the ministry responsibility for climate change. Initially there was an expectation that some of the measures introduced by the previous Labor governments would be recovered, viz.:

- In November 2015 Australia is elected to the Green Climate Fund for 2016;
- Australia agrees to adopt the Paris Agreement on containing global temperature increases;
- The CER holds a second auction of EWRf with a total of 129 carbon abatement contracts awarded for \$A557 million, at an average price of \$A12.25 per tonne.

The government established a Clean Energy Innovation Fund in March 2016, with \$A1bn to invest in pilot and demonstration clean energy projects. The largest commitments of the fund to date included investment commitments of \$200m to the Westpac Energy-efficiency Financing Program; \$20m for a securitised green bond with Flexigroup; a \$90m commitment to a Climate Bond with Westpac; a \$50m equity commitment to a renewable energy investment strategy with Palisade Investment Partners; \$100m to the Australian Bioenergy Fund, a waste and bioenergy investment fund; \$67m for Australia's largest wind-farm at Ararat, Victoria; and \$15m for a Solar and battery hybrid with DeGrussa Copper Mine, Western Australia.

Of note, the *Final Report of the Independent Review into the Future Security of the National Electricity Market* (the Finkel Report), headed by Australia's chief scientist, was issued in June 2017. The Finkel Report posed a sharp challenge to a by then very divided government. It reported that 87 per cent of electricity production comes from fossil fuels – a percentage that needs to fall if Australia wishes to meet its commitments to ensure the planet is to avoid dangerous climate change. The fossil fuels used in Australian electricity production are mostly high-emission brown and black coal (77 per cent), with gas making up the remainder (ten per cent). The other 13 per cent of the total comes from renewable energy (Sturmer 2017). The government agreed to adopt all but one of the recommendations, the last-mentioned being renewal of a clean energy target (CET). The CET remains unendorsed at the time of this report.

A further complication arose in September 2017 with the release of the Australian Energy Market Commission (AEMC) report on prospects facing the energy sector. The report stated

that energy policy uncertainty in recent years had led to investment delays and consequent electricity price rises and risks to the security and reliability of the system. It noted that, “This uncertainty, around incentives for renewable energy or penalties for emissions, has counteracted the signals for new investment coming from recent high wholesale prices”. And “If policy integration does not occur, the impact on the efficacy of pricing mechanisms, together with uncertainty and policy risk, will likely require ongoing government intervention ... transferring risks and costs to consumers”, as AMEC noted (reported in Latimer 2017). To underwrite the conclusion the chairman stated that the lack of a credible, long-term mechanism for achieving Australia’s emissions reduction commitments has created uncertainty and deterred investment in the electricity generation sector.

## The Rise of Renewables?

The impacts of policy inconsistency at a national level have been well-documented already. It is clear that energy corporations, both existing and renewable energy producers, have not been in a position to look to governments for reliable long-term policy or credible guidance on the direction of future policy. There is thus in Australia an uncertain future about energy supply, no guarantee of supply, massive investment uncertainty, a virtual capital ‘investment strike’ in coal production replacement facilities, and no clear way forward, with an ongoing debate on who is responsible for what (see Case Study III).

Australia’s energy production profile remains weighted heavily in favour of coal. Australia is not only the world’s largest exporter of coal, but coal is, as just noted, also the major fuel used in domestic electricity production. The challenge of transitioning to a low-carbon economy therefore very much requires changing the fuel mix in electricity generation. From 2014 onwards the major electricity production region in Australia, the LaTrobe Valley in the State of Victoria, has faced the consequences of capital flight from coal-fired power generation. With four major coal-fired generators, each owned by international corporate combinations, and one briquette production plant, a slow process of closure of the industry is underway (see Case

Study IV). In contrast, another corporation, AGL Ltd, also caught up in the energy policy maelstrom, has embarked on a twofold strategy of withdrawing from coal-fired generation and advocating a diverse and inclusive workforce as a way of meeting the challenges of transition to a low-carbon economy (Case Study V).

Renewable energy production in Australia has, not surprisingly, had a challenging history. While there were moves toward a low-carbon future in the early 2010s, by 2014/16 the renewable energy target was beset by uncertainty and an *ad hoc* advocacy of continued coal-fired generation for base load production. Approximately 17,500 GWh of renewable energy was generated in 2016 for meeting the large-scale component of the Renewable Energy Target (RET), which is set at 33,000 GWh for 2020. This put the industry just over halfway towards achieving the national target. Project activity was subdued in 2016, with three wind farms and seven solar power plants becoming operational. The solar plants were relatively small, with the exception of Fotowatio Renewable Ventures’ Moree Solar Farm, the second largest in the country, and Elecnor’s 25 MW Barcaldine Solar Farm. More than 35 projects were scheduled for construction during 2017. It is unknown at the time of reporting how many were under construction.

The impact of policy confusion is reflected in employment data in the renewable energy industry, which dropped 15 per cent to 11,150 in the 2015-16 financial year, down from more than 13,000 the year before (Clean Energy Council (2016) *Clean Energy Australia, Report 2016*, p. 6: <https://www.cleanenergycouncil.org.au/resources/resources-hub/clean-energy-australia-report>). Nonetheless, renewable energy generation increased sharply in 2016, supplying 17.3 per cent of Australia’s electricity throughout the year (the equivalent of almost 8 million average homes). In the main this was due to a boost in hydro-generation by 26 per cent compared to 2015.

There is now some evidence that the established business model for coal-fired generation is no longer attractive to energy firms (see Case Study V). Thus corporations are beginning to accommodate and adapt to a changing world, despite a lack of national policy support.

Hence companies such as Engie (formerly GDF Suez) are beginning to close or sell coal-fired generators while AGL is beginning to develop a 'green' transition, with the company gradually switching from coal to gas, biomass, solar and wind as energy sources. In both cases, these corporate initiatives were said by the companies themselves to be based on the view that over the long term energy and environment policy in Australia will resume its transition to a low-emissions regime.

Complementing such corporate moves, there is also evidence of small businesses emerging to take up the opportunities that major social and economic change creates (see Case VI). In the process, work has been relocated and repositioned as 'green' work, accompanied by some interesting debates on decent work.

## 4. Work, Skills and Training

The transition to a green economy necessarily involves changes in employment and skills. New occupational profiles and work will emerge 'that contribute to preserving or restoring the quality of the environment' (UNEP, 2011, p. 5) as well as 'green' jobs as such. But in the absence of a systematic and credible climate policy roadmap in Australia, there are both demand and supply issues with green skills. The creation of decent jobs, whether or not the 'job' is specifically 'green', remains a serious challenge (Stroud *et al.*, 2015). Nonetheless the prospects for transition to comparable 'decent' jobs may be limited by 'skills lock-in' (Stroud *et al.*, 2015). Thus, the shift to low-carbon production (and ultimately, a green economy) involves a transformation of the existing socio-technical regimes to overcome path-dependent 'lock-in' (Hassink, 2010). Indeed, the development of appropriate skills has been identified as a crucial element in green transition (Jagger *et al.*, 2012) although it is an under-researched factor in relation to the facilitation of (or constraints on) transition. It is thus necessary to examine particular sets of institutions (e.g. Vocational Education and Training systems) involved in regeneration and transition, which rely on the existence of social capital for their efficacy.

The report has already noted that there have been no major policy developments in Green Skills Training since 2012-13, and that the Green Skills Policy was largely developed within the context of the previous Labor Government's (2007-2013) climate commitments.

Importantly also, the current definitions of stakeholders and social partners in relation to decent jobs and green skills rest on assumptions about standardised employment relations, particularly those based on an explicit wage relationship. As indicated above, this relationship is now passing into history as the definitive legal relationship that defines labour (employees) and capital (employers). Increasingly, jobs are characterised by their precarity, forms of opaque digitisation and complex relationships in relation to small and medium enterprises and the complexities of,

and even distance from, standard forms of employment. These arrangements are further complicated by forms of co-working, voluntary working and assistance, along with complex arrangements in respect of employment and business models, forms of cooperation, associations, and typical forms of business organization. Hence the ILO's concept of stakeholders or social partners needs to be extended to include NGOs and other civil society groups that are increasingly active in this area (see Pape *et al.*, 2016). And, as McGrath and Powell (2015) argue, many current views of green skills, green jobs and green economies ultimately do not challenge existing notions of employability, accounts of learners' failings, and so forth. This project of reconceptualisation is challenging as indicated in Case Study V (Stucco), where even desirable bottom-up initiatives can be undone by lack of green training.

### 4.1 Vocational Education and Green Skills

The vocational education and training (VET) system and VET-trained workers play a crucial role in production and in the generation and diffusion of innovation (Toner 2011). The supply of an adequate quantity and quality of green skills in key industries such as manufacturing, construction, agriculture, vehicle repair, waste disposal, restaurants, hospitality and utilities such as water, electricity and gas relies significantly on a well-performing VET system. The VET system corresponds to the International Standard Classification of Education (ISCED) levels 4 and 5 that deliver post-school training, below the ISCED 6-8 that constitutes university bachelor degrees and above (Eurostat 2016). VET thus covers 'skilled workers' such as tradespeople and technicians, production and office-based workers, as well as remedial literacy and numeracy programmes.

Green skills training through VET typically takes three forms: first, as part of initial training for new workforce entrants such as for trade apprentices in which the courses incorporate green skills modules as an element of existing qualification; second, already qualified and experienced workers undertake short courses to update their green skills, for example to learn about new green technologies or regulations; finally, there are new occupations and therefore new VET qualifications created specifically in response to changed production methods, consumer demand and regulations, for example in the fields of renewable energy, recycling or waste treatment.

### The VET System in Australia

The Australian VET system is extensive, with a total of 4.2m students participating in 2016, representing 24.2 per cent of the Australian population aged 15-64 years (NCVER 2017a: 8). The sector is comprised of 4,279 training providers of which 75 per cent are private fee-for-service providers, the remainder being government-funded providers. In 2016 there were 1.3 million students enrolled in the government-funded system, representing 7.8 per cent of the Australian population aged 15-64 years (NCVER 2017b: 5-6).

A Green Skills Agreement was forged in 2009 between Australian governments, employers' associations, trade unions, the VET sector and community organizations. The Green Skills Agreement (COAG 2010) was framed in the context of the Bonn Declaration (2009), which stated that there is a need to "reorient education and training systems to address sustainability concerns through coherent policies at national and local levels." The Green Skills Agreement was largely developed through negotiations between Federal and State Governments and the role of social partners such as employers and unions was quite small.

The key objective of the Green Skills Agreement was to cement sustainability principles within the VET system to deliver sustainable jobs, products and advice (McDonald *et al* 2012). The GSA promised to:

- Embed skills for sustainability practice and teaching in vocational education and training, within the requirements of the national regulatory framework;
- Upskill VET instructors and teachers to deliver skills for sustainability;
- Review Training Packages to embed sustainability knowledge, skills and principles;
- Implement a transition strategy to re-skill vulnerable workers.

The Agreement proposed a programme of research to identify how jobs will be affected by climate-change-related measures; to assess anticipated or existing skills gaps; and to assess the institutional capacities of the tertiary education and training sector in addressing these skills gaps.

The aim was to build the capacity of the VET sector to deliver skills for sustainability in the workplace. This Agreement was given substance by the National VET Sector Sustainability Action Plan (NVSSAP) 2009-2012. The Plan sought to coordinate and support green workforce development initiatives at State and industry levels. Furthermore it aimed to build capacity to facilitate ongoing innovation and technology diffusion. These measures went from embedding sustainability topics across all training products to building the capacity of trainers and assessors, developing standards of certification for Registered Training Organizations (RTOs), and articulating paths between education and training sectors. Collaboration between the education sectors, industry and employer associations, Industry Skill Councils and governmental agencies was noted. The State of New South Wales prioritised green workforce development and business opportunities, while in Queensland the Cleantech Industry Development Strategy (QCIDS) was developed to support the increasing demand for clean, green technologies, products and services. The focus was to develop skills base sustainability and transition to a low-carbon economy. This policy was succeeded in 2014 by the Direct Action Plan.

The Green Skills Agreement was complemented by a series of varied skills-for-sustainability initiatives by the States of New South Wales,

## Skills for Green Jobs in Australia

Victoria, Queensland and Western Australia. This period saw an increase in green skills and efficiency training enrolments, which nearly doubled over a three-year period from 2008-09 to over 120,000 enrolments. Solar industry jobs peaked in 2011-12 and then fell. Overall, the number of jobs created did not reach what had been predicted or modelled, probably a reflection of the increasing policy uncertainty and division over climate change and implementation of skills measures. Nonetheless, this Agreement helped the VET sector to deliver a substantial skills programme, although further work was required to embed green skills, especially in energy-efficiency and supply chains. Moreover, the design of future skills for sustainability programmes required consideration of gender differences in relation to values and behaviour, and to gender and age differences, in learning skills for sustainability (Sack *et al.*, 2014).

With reference to the 'direct action policy', the Coalition government submitted to the United Nations Climate Change Conference in Paris in 2015 its climate change policy, an aspirational statement noting that the policy was aimed to support "business and the community to reduce emissions, while improving productivity and sustaining economic growth" (INDC, 2015). These initiatives are complemented by measures aimed at a range of sectors: energy; industrial processes and product use; agriculture; land-use, land-use change and forestry; and waste (INDC, 2015). There is no mention of green jobs and related measures; rather the aim is to achieve "emissions reductions in the context of future global action and technological innovation". Reference is made to the 'National Climate Resilience and Adaptation Strategy' (Commonwealth of Australia, 2015). This strategy contains reference to skills development and notes the 'Learning to Adapt' programme, first introduced in 2010 (by a Labor government). This programme comprises a three-day training course (one day a month for three months) aimed at professionals concerned with climate change adaptation planning and communication. By 2015 it had had over 400 attendees since its inception and had promoted 16 adaptation projects, including one for the Brisbane Airport Corporation. The training provides certification (Certified Environmental

Practitioner Climate Change Specialist) for practitioners.

The scope for VET to contribute to the supply of green skills is thus potentially great. However, there are persistent concerns regarding quality and malfeasance that are hindering the current performance of the system and its capacity to meet future skills needs in the economy. These concerns arise from three main sources:

- Increasing contracting-out of publicly-funded VET delivery to private colleges;
- Changes in the overall design of training content and assessment which created the conditions for opportunism and a reduction in the quality of VET delivered by private providers (Parliament of Australia 2015); *and*
- Funding restrictions which have reduced the capacity of TAFE to keep up-to-date with new technologies and deliver the volume of training in accordance with those developments (Toner 2014).

The Australian Training System is characterised by 61 Australian TAFE Institutes and approximately 5,000 private Registered Training Organisations (RTOs) (AIS, 2017). The training system is supported by three entities:

- i) The Australian Industry and Skills Committee (AISC), made up of representatives from industry leaders who make decisions on what qualifications are needed and when;
- ii) The Industry Reference Committees (IRCs) which oversee the development of Training Packages; *and*
- iii) The Skills Service Organisations (SSOs) which assist IRCs in developing training packages to suit industry needs.

There are approximately 60 training packages embodying over 1,600 qualifications covering about 85 per cent of Australian occupations (AIS, 2017). Training Packages define the competences required by different occupations and within different industries. Training institutions such as TAFE and other RTOs use training packages to help design curricula and learning and assessment methodologies. The Australian Vocational Education System

is based on occupational skills standards set out in units of competence and packaged into nationally consistent and portable qualifications (AIS 2017). Prior to 2016, these training packages were managed by Industry Skills Councils. Innovation and Business Skills Australia (IBSA) was previously defined as an ISC, but is now a registered SSO. IBSA is responsible for developing and updating the Sustainability Training Package which was last updated in December 2013.

### Creation of a 'Training Market'

Following the lead of other liberal market economies, notably the UK, Australia has embarked on a series of radical changes to the VET system. Over the last three decades Australian governments have been progressively contracting-out publicly-funded vocational activity, creating a 'training market' by making funds contestable between public and private VET providers for the delivery of publicly-funded training (Brown 2006, Hampson 2002).

The principal changes were the introduction in 1998 of user choice, and then in 2008 the agreement by Australian governments to make all public VET funding open to competition between public and private providers (COAG, 2008). Competition between public and private training organizations for the delivery of publicly-funded VET would, it was said, promote efficiency, innovation and create incentives for trainers to meet the specific needs of students and firms. Contestability resulted over time in a huge increase in the number of registered training providers (RTOs) from around 400 in 1995 to 4,500 in 2015, the great majority being private providers (Korbel and Misko 2017: 13). At the beginning of the 1990s almost all publicly-funded VET was delivered through publicly owned and operated institutions, notably Technical and Further Education (TAFE) colleges, and other institutions such as agricultural colleges. In 1996 98 per cent of students receiving publicly-funded VET were in public technical colleges or not-for-profit community education providers. By 2016 this figure had fallen to 58 per cent (NCVER, 2016: Table 11). In 2015 (latest data available) \$4bn or 42 per cent of total operating expenses

for publicly-funded VET went to non-public providers (NCVER 2016b: 5).

Two major complementary changes to pedagogy occurred in 1999 with the introduction of Training Packages and Competence Based Training (CBT). Training Packages created national, as opposed to State-based, qualifications and licensing. First, consistent with the goal of 'flexibility' and meeting the needs of industry, the skills and knowledge content in Training Packages is expressed broadly, permitting the customisation of training to the needs of individual students and firms. "Training packages do not suggest how a learner should be trained; rather, they specify the required skills and knowledge to perform effectively in the workplace" (Australian Skills Quality Authority 2017). Prior to the introduction of Training Packages, detailed and uniform curricula, textbooks, learning materials, assessment methods and standards were produced by specialist professional TAFE teachers. An explicit goal of the system was uniformity and consistency in training content and assessment for each occupation.

In contrast, under CBT teaching and assessment is tailored to the needs of the individual workplace. The resulting, "...lack of standardised national assessments means that there is no standard to ensure that a particular set of skills has in fact been acquired" (Guthrie, 2009: 13). External reviews of the VET system commissioned by the Federal Government drew similar conclusions. Allen Consulting (2013:9) found there is a "...strong general view that the Standards for the Regulation of VET are in need of fundamental revision reflecting concerns about aspects of VET quality". In particular, it found "...inadequate standards for delivery and assessment," covering virtually the entire system from specific trainer requirements to the volume of learning (Allen Consulting Group, 2013: vii-viii). These revisions have not taken place.

A key assumption in the creation of the training market over the last three decades is that competition would lift quality. This has not happened. Toner (2014) provides a detailed analysis of the causes of this failure in the VET market. This analysis is supported by detailed reports from the VET regulator, the Australian

Skills Quality Authority (2016) identifying systemic problems with the design and operation of the training market, viz.

- There is inadequate specification of standards relating to the volume, duration and quality of training under CBT and in Training Packages;
- There exists ‘information asymmetry’ between the training provider, who knows the true quality of their provision, and the prospective student, who does not; partly because of the inadequate standards and commitment to ‘consumer sovereignty’ by governments funding training, there is no public resource which rates or ranks the performance and outcomes of private training organizations;
- Ambiguity over their interpretation has created considerable latitude for some private providers to act opportunistically by diminishing the quality and quantity of training, thereby cutting costs and increasing profits;
- Educationists also argue that there are inherent problems with CBT and Training Packages (Knight 2012; Wheelahan and Moodie 2011); *and*
- There is concern that, owing to competition between providers, government funding cuts and rising enrolments, resources for off-the-job training are diminishing.

Deterioration in the quality of publicly-funded VET following creation of the training market has clear adverse consequences, especially for the development of inclusive and green skills. For employers it reduces access to appropriately-skilled labour. Low-quality, high-cost vocational education is also a particular problem for disadvantaged groups in the labour market, as the groups have higher participation in VET than other groups and skills acquisition is one of the few means they have for redressing their disadvantage in the labour market. Karmel and Lim (2013: 18-20) showed that young people in the lowest socio-economic status quintile are twice as likely as those in the highest quintile to participate in VET directed at remedying literacy and numeracy gaps; three times more likely to enrol in low-entry-level or lower-level qualifications; and 2.3 times more likely to be in an apprenticeship (Karmel and Lim 2013: 19-20).

## 4.2 Active Labour Market Programmes

Active Labour Markets Programmes (ALMPs) are sets of interventions that seek to increase employment participation by people receiving income support from government or who are at risk of becoming unemployed (for a review, see Borland, 2014). In Australia, these take three main forms:

- a) Job search;
- b) Work experience; *and*
- c) Formal training and education (for detail, see Borland, 2014: 2-3).

These programmes tend to be run by contracted employment service providers through the *jobactive* system. Such programmes do not increase jobs; rather they seek to ensure that as many of the unemployed as possible are ‘job-ready’, although these programmes are not necessarily focused on green jobs. In relation to youth unemployment, the Coalition government has both refined its approach (by introducing targeting and conditionality measures consistent with evidence from social welfare analysis) and introduced four-week waiting periods for under-25-year-olds.

In June 2017 the Federal Government announced a review of National Vocational Education legislation. The terms of reference do not include any reference to green or sustainable skills. The aim of the review is to push the regulatory framework for VET towards ‘outcomes-based regulation’; to move towards a ‘risk-based approach to compliance’; and to ensure that adequate information on training is available to VET ‘consumers’. In effect the continued stalemate of the Federal Government over transition to a low-carbon economy means that green skills training is being underplayed and is now a marginal issue. The Federal Government has become more focused on the skills issues already prominent in the labour market, as opposed to ‘potential’ skills shortages arising from the transition to a green economy. Indeed, without stronger signals in relation to emissions reduction, renewable energy and so forth, it might be said that the likely

demand for more explicit green skills training is modest. Nevertheless there are examples of skills development for green jobs at State (or provincial) level.

### 4.3 Social care and green jobs

Section 4.1 of the report noted that there has been an attempt to construct VET as a 'market'. This section suggests that social care is also being re-organized as a market. The marketisation of social care in Australia is having quite adverse implications for work and employment. Care provision, including disability support, is increasingly likely to be commodified and purchased by people with disabilities through markets. These developments are predicated as care workforces comprising low-paid workers with insecure and poor working conditions. The recently-established National Disability Insurance Scheme (NDIS) is characteristic of this trend. This scheme provides a national system of (voucher-like) support for people with permanent and significant disabilities. Such people can take steps to secure 'personalised' support: they can select preferred providers; organize and arrange their own support; or appoint someone or an organization to manage their funding and support. This is effectively an individualisation of disability support and threatens both support workers and those supported. One immediate problem is that without collective organization and representation both to provide workers (and disabled persons) with a voice and to reshape public policy on disability in these developments, this trend will not be reversed (Macdonald and Charlesworth, 2016). Workers in the care and support area tend to be low-paid, have low levels of unionisation and work in small and fragmented workplaces. Similarly, the expectation that people living with disability can be helped to engage in this new 'marketplace for care' as fully-informed, rational consumers requires heroic assumptions. Case Study XII examines how people living with a disability can involve themselves in the green skills agenda.

### 4.4 What could VET and Training look like?

Given the evident failures of top-down policy developments for a low-carbon economy, green skills and decent work, a different approach seems necessary. Building on this insight, McGrath and Powell (2015) argue for a re-thinking of VET that confronts both the broader challenges facing it and the specific challenges of green skills. They argue for the following:

*'a re-imagined purpose of VET that should be grounded in a view of work, and hence skills for work, that is decent, life-enhancing, solidaristic, gender aware, environmentally sensitive and inter-generationally minded. Such a view must confront the reality that much current VET is complicit in preparing people for work that lacks some or all of these characteristics...In doing all this it must minimise the cost and risks of any transformation for the poor and seek to facilitate them into better and communal lives...'*

Such a re-thinking would have to involve consolidating and developing the bottom-up measures and diverse initiatives that have taken place over recent years. These matters are addressed in the next section.

## 5. Analysis of case studies

The institutional arrangements in Australia for skills development for green jobs and sustainable jobs are uneven, yet strongly indicative of bottom-up developments in process. They involve several related developments.

First, Australia's policies are informed by a claim that the country has an 'exceptional' climate, which should be taken into account in policy development on climate change. This claim allowed the federal government to secure agreement at the Kyoto Climate Change Conference (1997) that its emissions levels accounting could be adjusted for terrestrial carbon offsets. These commitments have enabled the government to create Australian Carbon Credit Units, and to promote them as one of the ways of protecting the agricultural sector while meeting international obligations. These arrangements were formalised under the Carbon Farming Initiative *via* the Carbon Credits (Carbon Farming Initiative), 2011 (for a critical review see Rickards *et al.*, 2017).

But, and of note, carbon neutrality has a longer provenance than this legislative recognition. Over a forty-year period a cattle-farming household in southern Victoria has successfully had their farm declared carbon-neutral (Case Study VIII). One critical ingredient of this process was the couple's learning *via* voluntary environmental organizations such as Landcare, which in turn enabled them to take decisive steps towards achieving carbon neutrality even when this was an undeveloped and unsupported concept. This process suggests that it is necessary to develop a much broader definition of green skills learning. Landcare is a voluntary organization focusing on environmental matters; it promotes workshops, provides voluntary support to local landholders and helps create a learning culture on environmental concerns. Hence not only are the formal training and educational bodies critical for skills development but so too is learning *via* experience, social engagement and voluntary activity aimed at addressing the implications of carbon emissions.

At the same time there were signs that localised initiatives have emerged which suggest that, despite the best intentions of successive governments, low-carbon goals can be realised and green skills acquired and honed. First, indigenous communities have begun to show the way forward with important small-scale projects, focused on biodiversity and the celebration of traditional conservation practices (see Case Study VII). The outcome was carbon abatement of some significance. These developments involve consideration of distinctive forms of knowledge and their application. But not all initiatives are successful or longstanding. One interpretation of skills building in relation to green skills recalls wartime mentalities and preparation for the exceptionalism that characterises Australia. Governments during this period introduced an elasticity in relation to the concepts of 'green' skilling that redefined the term. One example is the creation of a 'green' army recalling the cold war sentiments of a land army prepared for the ever-present external dangers that abound (see above, Case Study I).

The third feature of green skills development involves recognition of change and the emerging significance of green skills. Unions, as leaders in relation to climate change initiatives, have long been involved in addressing the skills associated with climate change. For example individual unions have embraced policies and practices in relation to green skills and the foundations for a just transition to a low-carbon economy. As early as 2011 the Amalgamated Manufacturing Workers' Union (AMWU) committed itself to explaining to its members the risks of maintaining the *status quo* and the importance for both members and their households of anticipating the likely patterns of change. In 2011 the union released a detailed plan for 'low-emissions industry and technology development' which outlined specific proposals for transitioning other Australian industries (AMWU, 2011). Unfortunately, many of these measures could not be realised when a key segment of their membership, the automobile production workers, lost their jobs following the withdrawal

by three major companies from automobile production in Australia in 2017.

Complementing such steps, other unions have promoted and developed skills programmes focused on green skills. This approach involved a recasting of representational forms, often relating to more traditional approaches to workplace environment matters, for example *via* health and safety representatives and associated committees. One approach entails dedicated representatives, trained and aware of the social implications of climate change. The Queensland Public Service Union's 'climate change heroes' programme offers a good example of this approach (Queensland Public Service Union, 2010). Cast in terms of 'climate change action', the union seeks to focus action around dedicated representatives operating on relevant committees and promoting policy change at workplace level.

A different approach entails policies and programmes to retrain existing workers in the skills necessary for a 'green' economy as well as training new workers (evident in Case Study VI – Gippsland Solar). In July 2008 the Plumbing Division of the Communications Electrical Plumbing Union (CEPU), in conjunction with a range of other industry and trade bodies, announced the opening of a 'Green Plumbing Centre', titled the Plumbing Industry Climate Action Centre. These other organizations included the Master Plumbers and Mechanical Services Association of Australia, the National Fire Industry Association, the Air Conditioning and Mechanical Contractors' Association of Victoria, the Plumbing Industry Commission and the Building Commission, along with the Victorian State Government. This Centre is a working example of innovative design and sustainable plumbing (<http://picac.vic.edu.au/picacs-facilities>). It provides leading-edge training to plumbers at all levels and in relation to a wide range of building settings. Complementing this facility the union provides free training for members (and subsidised training for 'immediate family members' through its 'Registered Training Organisation', CEPU-TEC, established in 1997). These programmes include short and long training courses, New Technologies Training, Plumbing Trades and

generalist courses. These courses incorporate recognition of climate change.

While a redefinition of the nature and character of both workforces and the training approaches is under way, path-breaking research is also under way to show how far an understanding of the transition to a low-carbon economy is only partial if the ways in which gendered inequality define outcomes are not understood (see Case Study IX).

The Case Studies suggest that, in the absence of a clear and decisive national framework, the strands that constitute steps towards a low-carbon economy that include steps towards decent work are evident, but are necessarily complex and diverse.

## 6. Conclusions and recommendations

The current report updates the 2009 report and frames that analysis in the context of the United Nations Sustainable Development Goals, in particular SDG8 concerning the promotion of inclusive and sustainable growth, as well as other SDGs targeting sustainable economic growth and environmental sustainability.

The cautious optimism of the 2009 report was appropriate, but climate policy subsequently became mired in political and ideological debate. The Australian political debate on climate change became fractious and inconclusive. A raft of measures was introduced during the period, only to be subsequently stalled and then in various ways re-crafted and walked back. The outcome is ongoing uncertainty on the future of clean energy, and on the skills and labour market implications of that future.

The lessons are powerful. First, if the approaches to the accomplishment of a green world are left to the traditional voices, then it is likely to be the powerful who will prevail. Furthermore, and as an extension of the foregoing, approaches that rely on delivering a green economy and green skills on a top-down basis will be vulnerable to capture by powerful and well-funded interest groups, especially the coal lobby and those with a vested interest in preserving the *status quo*. It is in part this centralisation of political and economic power that has produced an 'inequality deficit' and made inclusive growth so problematic. Second, and linked to this finding, there is a need for a re-opening of the concept of green skills and by implication its links with decent work. There may need to be a clearer recognition that there are powerful forces undermining the stability and security of existing labour conditions and that decent work could be developed to take into account the non-standard, the marginal and the innovative. **We recommend that further attention be given to the definitions of green skills and decent work, so that the evolving aspects of work and employment are taken into account, as well as how social policy around working life (welfare, housing, health and so on) interacts with the**

**world of work.** In particular, the report has found that the links between green skills and decent work are no longer as clear as they were in 2009. Furthermore, with the historical links between work and living standards increasingly being challenged, the prominent role of social policy in protecting decent working lives has become even more important. In short, more discussion of the role of green skills and green work may be needed in an era when the prospect for decent work for many is under threat.

As this report shows, building a coherent green skills policy in Australia has been made even more complicated by successive national government policies privatising the university and vocational education sectors, and introducing fee-based programmes for participants, which has both affected the quality of the education and training programmes and undermined the challenge of making growth more inclusive. **We recommend that education and training approaches be reviewed, with the aim of defining both the scope and scale of such learning in imaginative and inclusive ways, taking into account the variety of experience and understanding evident in local settings.**

Redefining skills calls for greater inclusion of indigenous expertise and better attention to gender equality as fundamental to progress towards a green economy. To that end **we recommend the use of gender mainstreaming through technical and political processes.** The report struggled to find measures of the gender effects of changing patterns of skills training and work. Technical processes involve the tools of gender-disaggregated statistics, gender impact assessment, and the development of equality indicators. Political dimensions of gender mainstreaming include agenda-setting opportunities to enhance the inclusion and participation of women in decision-making. Such a project could include:

- a) Constructing and monitoring gender-disaggregated statistical databases so that

one can see, for example, who is losing jobs and who is gaining them (both men and women) in the transition to a greener economy;

- b) Developing a process for gender-aware consultation, such a process being clear about which social partners are identified and who is being consulted;
- c) Implementing gender impact analysis of all programmes for transition to a greener economy; this will show the extent to which each programme at least does not exacerbate gender inequality, and facilitates development of local, regional and national strategies for moving towards a positive net gender impact through green employment.

Finally, the report found that **the focus on traditional social partners in explaining the evolution of in green skills and work may need expansion to include a range of other civil society actors**, including environmental and social justice groups. In Australia these groups have been very important in keeping the issues of climate change abatement and decent work included in national discussions and debates. While the structural mandate of the ILO may limit this as a formal view, the Australian case suggests that the green skills and decent work agenda now relies for its historical continuity on both the existing social partners and the social movement groups that owe much of their impetus to concerns about climate change and social justice.

## 7. References

- ABC Gippsland (2012) *Contract for closure off*, <http://www.abc.net.au/local/stories/2012/09/05/3583240.htm>
- AGL (2017) *Diversity and Inclusion* <http://agl2016.sustainability-report.com.au/people/diversity-and-inclusion>
- AIS (2017) The National Training System. Australian Industry Standards. Available <http://www.australianindustrystandards.org.au/national-training-system/>. Accessed 1 Sept. 2017
- AISC (2016) Industry Reference Committees: Operating Framework for the Development of Training Packages. Australian Industry Skills Committee.
- AMWU (2011) *A Plan for Low-Emissions Industry and Technology Development in Australia*. AMWU National Office, Granville, Australia <http://www.amwu.org.au/campaigns/46/CT/> accessed 23 June 2011
- Australian Bureau of Statistics (2016) *Characteristics of Employment*, Australia, Cat. No. 6333.0
- Australian Government – Workplace Gender Equality Agency (2012) *Diversity Big day Out*, AGL Limited case study, [www.wgea.gov.au](http://www.wgea.gov.au)
- Australian Greens (2014) Australian Greens Dissenting Report. Senate Standing Committee on Education and Employment. Australian Government Canberra [http://www.aph.gov.au/Parliamentary\\_Business/Committees/Senate/Education\\_and\\_Employment/Green\\_Army/Report/d01](http://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Education_and_Employment/Green_Army/Report/d01)
- Australian Labor Party (2016) National Platform, Australian Labor Party, Canberra. [https://cdn.australianlabor.com.au/documents/ALP\\_National\\_Platform.pdf](https://cdn.australianlabor.com.au/documents/ALP_National_Platform.pdf)
- Australian Skills Quality Authority (2016b) *Strategic reviews* <http://www.asqa.gov.au/about/strategic-reviews/strategic-reviews.html>
- Borland, J. (2014) 'Dealing with unemployment: What should be the role of labour market programs', *Evidence Base*, No. 4. doi: 10.4225/50/558110C9B892D
- Brown, Tony (2006) From Union Inspired to Industry Led: How Australian Labour's Training Reform Experiment Turned Sour, *Journal of Industrial Relations*, Vol. 48, No. 4. pp.491-505
- Bryan, R., Rafferty, M. (2011). Monetary Equivalence and Functionalism: Implications for Central Banking. In Heiner Ganssmann (Eds.), *New Approaches to Monetary Theory: Interdisciplinary Perspectives*, (pp. 171-190). London, United Kingdom: Routledge imprint of Taylor & Francis.
- Bryan, R. (2010). Australian Populism and the Global Financial Crisis: Finding a Place for Labour. *Labour and Industry*, 20(3), 250-269.
- Rafferty, M., Bryan, R., Wigan, D. (2017). The Map and the Territory: Exploring Capital's New Financialised Spatialities. In Jane Pollard and Ron Martin (Eds.), *Handbook on the Geographies of Money and Finance*. United Kingdom: Edward Elgar Publishing.
- Carbon Market Institute, 2017 <http://marketplace.carbonmarketinstitute.org/west-arnhem-land-fire-abatement-stage-2-walfa2-project/>
- Carbon Market Institute (2016) *Australian Climate Policy, Survey 2016*, <http://carbonmarketinstitute.org/wp-content/uploads/2016/10/CMI-Australian-Climate-Policy-Survey-2016.pdf>
- Clean Energy Regulator (2017) Postcode data for small-scale installations, Commonwealth of Australia <http://www.cleanenergyregulator.gov.au/RET/Forms-and-resources/Postcode-data-for-small-scale-installations#Smallscale-installations-by-installation-year>
- Clarke, J. Alston, M. & Whittenbury, K. 2017. Social Sustainability In Dairying Communities Impacted By The Murraydarling Basin Plan: Short Report on research findings July 2017 <http://www.med.monash.edu.au/glass/docs/monash-dairying-communities-short-report-online.pdf>
- Commonwealth of Australia (2015) *National Climate Resilience and Adaptation Strategy 2015* <https://www.environment.gov.au/system/files/resources/3b44e21e-2a78-4809-87c7-a1386e350c29/>

- files/national-climate-resilience-and-adaptation-strategy.pdf
- COAG (2008) Council of Australian Governments Meeting, Cangera 29 November 2008, Communique <https://www.coag.gov.au/sites/default/files/communique/2008-29-11.pdf>
- COAG (2010) Green Skills Agreement. Council of Australian Governments, Commonwealth of Australia Canberra
- CPSISC (2015) Environmental Scan 2014-15. Construction and Property Services Industry Skill Council. [https://www.cpsisc.com.au/resources/CPSISC/Corporate\\_docs/CPSISC%20ES%202014%20FINAL2.pdf](https://www.cpsisc.com.au/resources/CPSISC/Corporate_docs/CPSISC%20ES%202014%20FINAL2.pdf)
- Curtain, Richard (1987) 'Skill formation and the enterprise', *Labour and Industry* 1(1) October:8-38.
- Department of Education (2016a (2016b) *Redesigning VET FEE-HELP: Discussion Paper*, <https://docs.education.gov.au/documents/redesigning-vet-fee-help-discussion-paper>
- DES (2005) *Victorian greenhouse strategy action plan update*, Victorian Government Department of Sustainability and Environment [http://www.climatechange.vic.gov.au/\\_data/assets/pdf\\_file/0020/125426/Victorian-Greenhouse-Strategy-Action-Plan-Update-2005.pdf](http://www.climatechange.vic.gov.au/_data/assets/pdf_file/0020/125426/Victorian-Greenhouse-Strategy-Action-Plan-Update-2005.pdf)
- Environment Victoria: <https://environmentvictoria.org.au/hazelwood-faqs/>
- Eurostat (2016) *International Standard Classification of Education (ISCED)*, [http://ec.europa.eu/eurostat/statistics-explained/index.php/International\\_Standard\\_Classification\\_of\\_Education\\_\(ISCED\)](http://ec.europa.eu/eurostat/statistics-explained/index.php/International_Standard_Classification_of_Education_(ISCED))
- Finkel A. (2017) *Blueprint for the Future: Independent Review into the Future Security of the National Electricity Market*. Department of Energy and Finance. Australian Government. Canberra.
- Hangar, I. (2014) *Report of the Royal Commission into the Home Insulation Program*, AGPS, Canberra.
- Hampell, B. (2015) *Against the grain*, Dural, NSW; Rosenberg Publishing: 56)
- Hannam P (2016) Confidence in renewable energy sector 'evaporated' after Abbott cut: Bloomberg. Sydney Morning Herald January 15 2016. <http://www.smh.com.au/environment/climate-change/confidence-in-renewable-energy-sector-evaporated-after-abbott-cut-bloomberg-20160114-gm5qbo.html>
- Hassink R (2010) 'Locked in decline? On the role of regional lock-ins in old industrial areas'. In R. Boschma and R. Martin (eds) *Handbook of Evolutionary Economic Geography*. Cheltenham: Edward Elgar, pp.450-468.
- INDC (2015) Australia's Intended Nationally Determined Contribution to a new Climate Change Agreement | August 2015 <http://dfat.gov.au/international-relations/themes/climate-change/submissions/Documents/aus-intended-nationally-determined-cont-new-cc-agreement-aug-2015.pdf>
- International Labour Organization (ILO) (2107) 'Joint Emp/Skills-Green Jobs Programme and Research Project – Skills for Green Jobs II – Terms of Reference' ILO, Geneva.
- Jagger N, Foxon T and Gouldson A (2012) *Skills Constraints for Low-Carbon Transitions*. Sustainability Research Institute Paper No. 31, University of Leeds.
- Karmel, T & Lim, P 2013, Socioeconomic disadvantage and participation in tertiary education: preliminary thoughts, NCVER, Adelaide. [https://www.ncver.edu.au/\\_data/assets/file/0024/9393/socioeconomic-disadvantage-2612.pdf](https://www.ncver.edu.au/_data/assets/file/0024/9393/socioeconomic-disadvantage-2612.pdf)
- Kumarasiri J. and Gunasekarage A. (2017) Risk regulation, community pressure and the use of management accounting in managing climate change risk: Australian evidence. *British Accounting Review*. Vol 49, 1, pp.25-38.
- Latimer, C (2017) 'Failure to fully implement Finkel Review causing energy uncertainty: AEMC' *Sydney Morning Herald* September 12, <http://marketplace.carbonmarketinstitute.org/west-arnhem-land-fire-abatement-walfa-project/>
- Macdonald, F and Charlesworth, S (2016) 'Cash for care under the NDIS: Shaping care workers' working conditions?', *Journal of Industrial Relations*, 58 (5): 627 – 646.
- McGrath S and Powell, L (2016) 'Skills for Sustainable Development: Transforming vocational education and training beyond 2015' *International Journal of*

- Educational Development*, Vol 50, September pp12-19.
- McDonald, G, Condon, L, and Riordan Martin (2012) The Australian Green Skills Agreement Policy and Industry Context, Institutional Response and Green Skills Delivery. TAFE Directors Australia, Sydney.
- Murray Basin Darling Authority (2017) *Basin Plan*, <https://www.mdba.gov.au/basin-plan/whats-basin-plan>
- National VET Sector Sustainability Action Group (2009) 'National VET Sector Sustainability Policy and Action Plan (2009-2012)' Ministerial Council for Vocational Education and Technical Education (MCVETE). Canberra.
- NCVER (2016a) Historical time series of government-funded vocational education and training in Australia, from 1981.
- (2016b: 5) Australian vocational education and training statistics: financial information 2015, NCVER, Adelaide. <https://www.ncver.edu.au/data/data/all-data/historical-time-series-of-government-funded-vocational-education-and-training-from-1981-to-2016>
- (2017a), Australian vocational education and training statistics: total VET students and courses 2016, NCVER, Adelaide.
- NCVER 2017b, Australian vocational education and training statistics: government-funded students and courses 2016, NCVER, Adelaide. [https://www.ncver.edu.au/\\_data/assets/pdf\\_file/0028/660538/Government-funded-students-and-courses-2016.pdf](https://www.ncver.edu.au/_data/assets/pdf_file/0028/660538/Government-funded-students-and-courses-2016.pdf)
- NSW Government (2017) Energy Savings Scheme. Department of Planning and Environment. <http://www.resourcesandenergy.nsw.gov.au/energy-consumers/sustainable-energy/efficiency/scheme>
- Pape, M, Fairbrother, P and Snell, D (2016) 'Beyond the State: Shaping Governance in an Australian Region, *Regional Studies*, Vol 50, 5.
- Parliament of Australia (2013) Direct Action Plan. Senate Committee on Environment and Communications. Canberra. [http://www.aph.gov.au/Parliamentary\\_Business/Committees/Senate/Environment\\_and\\_Communications/Direct\\_Action\\_Plan/Report/c05](http://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Environment_and_Communications/Direct_Action_Plan/Report/c05)
- Parliament of Australia (2015) *Final Report The operation, regulation and funding of private vocational education and training (VET) providers in Australia*, [http://www.aph.gov.au/Parliamentary\\_Business/Committees/Senate/Education\\_and\\_Employment/vocationale/Final\\_Report](http://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Education_and_Employment/vocationale/Final_Report)
- Parliament of Australia (2017) About the Emissions Reduction Fund. Commonwealth of Australia. Canberra. <http://www.environment.gov.au/climate-change/emissions-reduction-fund/about>
- Pearse, R. (2017) "Continuity and change": Environmental policy in the 2016 Australian Federal election and the coming energy transition', J. Curtin, A. Gauja, P. Chen & J. Pietsch eds. The 2016 Australian Federal Election, Canberra: ANU Press.
- Queensland Public Service Union and Australian Conservation Foundation (2010) Hero Missions. Available at: [http://www.qpsu.org.au/climate/news/090525\\_difference.htm](http://www.qpsu.org.au/climate/news/090525_difference.htm)
- Rafferty, M. and Yu, S. (2010) *Skills for green jobs in Australia*, International Labour Office, Skills and Employability Department. - Geneva: ILO.
- Rickards, L., Neale, T. and Kearnes, M. (2017) 'Australia's national climate: learning to adapt', *Geographical Research*, doi:10.1111/1745-5871.12240
- Rootes, C., 2008, 'The first climate change election? The Australian general election of 24 November 2007', *Environmental Politics* 17(3), pp. 473-480.
- Rudd, K., 2007, 'Climate Change: Forging a new consensus', Paper presented at the National Climate Change Summit, retrieved from: [http://parlinfo.aph.gov.au:80/parlInfo/download/media/pressrel/H4OM6/upload\\_binary/h4om62.pdf](http://parlinfo.aph.gov.au:80/parlInfo/download/media/pressrel/H4OM6/upload_binary/h4om62.pdf)
- Sack, F., Brown, M., Rahimi, M. and Turnbull, J. (2014) *Gen green 4 Australia: a national study of demand for and supply of skills for sustainability*, Sustainability/WorldSkills Australia. <http://apo.org.au/system/files/40363/apo-nid40363-51576.pdf>
- Sommerfeld J. and Vine, D. (2017) Influence of demographic variables on uptake of domestic solar photovoltaic technology' *Renewable and Sustainable Energy Reviews*. Vol. 67. Pp. 315-323.

- Stroud, D., Blake, J., Evans, C. and Fairbrother, P (2015) Governments matter for capitalist economies: Regeneration and transition to green and decent jobs, *Economic and Industrial Democracy*. DOI: 10.1177/0143831X15601731
- Sturmer, J (2017) 'Finkel report: Major review of Australia's energy sector explained' ABC online, <http://www.abc.net.au/news/2017-06-09/finkel-energy-report-explained/8602524>
- SVA (2016) 'Social Return on Investment analysis of the Warddeken Indigenous Protected Area and associated Indigenous ranger programme' Social Ventures Australia. Office of Prime Minister and Cabinet.
- Teeter P. and Sandberg J. (2016) Constraining or Enabling Green Capability Development? How Policy Uncertainty Affects Organizational Responses to Flexible Environmental Regulations. *British Journal of Management*.
- Talberg, A, Hui, S, Loynes, K (2016), Australian climate change policy to 2015: a chronology, Parliamentary Library Research Paper Series 2015-16, [http://parlinfo.aph.gov.au/parlInfo/download/library/prspub/4590624/upload\\_binary/4590624.pdf;fileType=application/pdf](http://parlinfo.aph.gov.au/parlInfo/download/library/prspub/4590624/upload_binary/4590624.pdf;fileType=application/pdf).
- Talberg, A and Workman A (2017) Timeline: Australian climate and clean air policy interventions 2013-16, Developments under the Abbott-Turnbull government, Working Paper 01, Australian-German Climate Energy College, University of Melbourne.
- Toner P. (2005) *Keeping up with technology: A pilot study of TAFE and the manufacturing sector*, National Centre for Vocational Education Research, Adelaide.
- (2011) *Workforce Skills and Innovation: An Overview of Major Themes in the Literature*, Directorate for Science, Technology and Industry Working Paper, Organisation for Economic Co-operation and Development, Paris <http://www.oecd.org/dataoecd/19/10/46970941.pdf>
- (2014) Contracting out publicly funded vocational education: A transaction cost critique, *The Economic and Labour Relations Review*, Vol. 25(2) 222-239
- UNEP (2011) *Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication*. Switzerland: UNEP.
- United Nations Educational Scientific and Cultural Organization, and the International Labour Organization (1964) *Technical and vocational education and training. Recommendations by UNESCO and the International Labour Organization*, <http://unesdoc.un>
- Uren, D (2017) 'Living standards in decline as real wage growth stagnates' *The Australian*, April 17
- Warddeken (2010) Warddeken Land Management Annual Report, Northern Territory.
- WWF (2003) *Australia's Polluting Power: Coal-fired electricity and its impact on global warming*, Discussion paper 03/02 [http://awsassets.wwf.org.au/downloads/cl022\\_australias\\_polluting\\_power\\_coal\\_fired\\_electricity\\_06apr03.pdf](http://awsassets.wwf.org.au/downloads/cl022_australias_polluting_power_coal_fired_electricity_06apr03.pdf)
- [http://www.foe.org.au/here\\_we\\_go\\_again](http://www.foe.org.au/here_we_go_again)
- <https://www.thesaturdaypaper.com.au/news/politics/2017/08/19/nobbling-the-charities/15030648005086>

## 8. List of key resource persons

(interviewees, participants in the focus groups, expert panels, etc.)

Given the imposed time constraints this report was based on desk-top research, with several off-the-record discussions with representatives of stakeholder organizations.



## 9. Annex

### Q Case Study I. The Home Insulation Program (HIP)

In February 2009, in the wake of the Global Financial Crisis, the Rudd Federal Labor Government (2007-2011) initiated a \$A24 billion stimulus package (dubbed the 'Nation Building and Jobs Plan') to avert a possible economic downturn. Part of that package was an 'Energy-efficient Homes Package' (EEHP).

The EEHP consisted of three parts: a Ceiling Insulation Plan, allocated \$2.7 billion and later renamed the Home Insulation Program (HIP); the Low Emissions Assistance Plan for Renters (LEAPR) Programme, allocated \$613 million; and a further \$507 million allocated to replacing electrical hot water systems with solar hot water systems, named the Solar Hot Water Rebate (SHWR) Programme (Hangar 2014).

The stated goal for the HIP was to retrofit (in contrast to installing at the time of construction) insulation into the ceilings of 2.2 million Australian houses over a period of two-and-a-half years. To put the HIP goal into context, prior to February 2009 there were around 200 businesses retro-fitting insulation into approximately 70,000 houses per annum. The HIP aimed to achieve an approximate fifteen-fold increase in the number of installations per year, more than the pre-HIP annual number of installations being carried out each and every month under the HIP. Several problems occurred with the HIP, including lack of adequate training for working in the roof spaces of houses of various ages and conditions, and for working with potentially dangerous materials. Unfortunately, four young workers died retrofitting insulation. In 2011 the programme was stopped and a Royal Commission initiated to review the programme and find out what happened. One of the key findings of the Royal Commission was that the programme was too ambitious and did not establish safeguards for worker training and site safety. As the Report noted:

It ought to have been obvious, to any competent administration, that such an exponential increase in work to be undertaken would require a similarly huge increase in the workforce to do it. Indeed... one of the policy objectives for the HIP was to provide work for those thought to be at risk of losing their jobs during the aftermath of the Global Financial Crisis, particularly in the construction and allied industries. This objective was achieved, with the number of insulation installation businesses increasing from approximately 200 prior to the HIP to 8,359 registered businesses with an estimated total workforce of over 12,000 in October 2009.

It ought also to have been obvious to any competent administration that the injection of a large amount of money into an industry that was largely 'unregulated' would carry with it the risk of rorting (excess pricing) and other unscrupulous behaviour.

The Royal Commission report also questioned the appropriateness of the Government's combining a stimulus policy with an energy-efficiency policy such as the HIP. The report suggested that the tension between the stimulus objective of the policy, with its need for rapid expansion, and the energy-efficiency objectives of the policy, caused a number of decisions to be made under the HIP that may have unnecessarily exposed workers, particularly inexperienced workers, to an unacceptably high risk of injury or death.

The report also raised the issue of training and the competences required of people installing insulation, as well as the regulatory regime for retrofitting insulation in the residential sector. The reporting team was told by more than one witness who gave evidence that the insulation industry was chosen as suitable for the HIP as a stimulus measure since it was largely 'unregulated' and therefore businesses could move quickly into the industry. With the exception of one State government there was no insulation-industry-specific regulation beyond the generally-applicable occupational health and safety regulation.

A key conclusion of the report was that:

*“The reality is that the Australian Government conceived of, devised, designed and implemented a program that enabled very large numbers of inexperienced workers – often engaged by unscrupulous and avaricious employers or head contractors, who were themselves inexperienced in insulation installation—to undertake potentially dangerous work. It should have done more to protect them.”*

The report concluded that each of the deaths would have been preventable had the training and regulatory regime been better designed and implemented.

The termination of the HIP had two legacy issues. First, it caused hardship for businesses that had, prior to the HIP, successfully carried out installation of insulation in new and existing homes. They had invested in plant and equipment and purchased insulation stock, much of which was wasted and worthless when the HIP was terminated. A remediation package, introduced with a view to mitigating the effects of the termination, was insufficient to achieve that aim to any satisfactory degree. Second, the failure of the HIP to protect workers from harm (to make green jobs decent jobs) damaged the credibility of home energy-efficiency and the ‘moral’ credibility of the shift toward a lower-carbon economy. By failing to adequately train and protect those young workers undertaking the retrofitting installation, it encouraged those parties wishing to attack the shift to a lower-carbon economy.

**Source: Royal Commission into the Home Insulation Program (HIP), also known as the Hangar Inquiry (Hangar, I. (2014) *Report of the Royal Commission into the Home Insulation Program*, AGPS, Canberra).**

## Q Case Study II. The ‘Green Army’

The ‘Green Army’ programme was both launched and discontinued in 2016. The programme was provided with \$300m of funding over four years. However, at the same time \$484m was cut from Landcare and other environmental programmes.

Participants in the programme were defined as ‘volunteers’ aged between 17 and 24 years who participated for up to 30 hours per week in environmental conservation projects. The projects included tasks such as cleaning up riverbanks and creek beds and revegetating sand-dunes and mangrove habitats. Green army participants received an allowance of between \$10.14 and \$16.45 per hour. The full-time minimum wage for adults in 2014 was \$16.37 per hour. Trainees, apprentices and juniors who participated without an award agreement were paid a percentage of this rate that increased with age. Green Army participants were excluded from relevant social security and pension benefits (except family assistance and childcare payments) and were not defined as workers or employees in the context of Commonwealth laws.

When the legislation was passed, the Australian Greens published a dissenting report, arguing that the legislation created no accredited training pathways into jobs and that the programme excluded participants from relevant insurance and employee protections. The report also highlighted the limited environmental outcomes of the programme. A Federal Government assessment of the programme was due at the beginning of 2017, but the programme’s funding was discontinued in December 2016, some being diverted back to Landcare. The Green Army was therefore largely a politically-motivated programme with few serious skills or employment outcomes. This case study shows that employment programmes with serious skills components are not being developing in any serious or sustained way, with political populism affecting both jobs and skills programmes.

## Q Case Study III. Effects of Policy Malaise

The 2016 Environment Performance Index dropped Australia's ranking by 10 places. Teeter and Sandberg (2016) argue that the policy uncertainty created by the churning of environmental regulation in the Australian context forces organizations to focus their responses on short-term investments and addressing the policy uncertainty.

Bloomberg New Energy Finance concluded that the actions of the Abbott Government to repeal the carbon tax in 2014 had 'destroyed confidence' in the renewable energy market (Hannam 2016). The 2017 Finkel review of the National Energy Market showed that investment in renewable energy had dropped by 52 per cent between 2013 and 2014 (Finkel 2017). The Finkel report also draws attention to the relatively short horizon of federal climate policy.

A study (Teeter and Sandberg 2016) of 300 organizations who were liable under the Clean Energy Act in mid-2012 found that policy uncertainty forced regulated organizations to focus on short-term investments with immediate paybacks. Teeter and Sandberg found that organizations also focused their attention on constant lobbying of government and on attempts to reduce confusion among their suppliers. The 300 organizations in the study responded to their obligations under the Clean Energy Act by implementing very few substantial efforts to reduce their carbon emissions. The organizations made 'every effort' to avoid emissions reductions, by challenging their need to comply, applying new accounting methods to reduce emissions on paper, and criticising engineers who put too much focus on emissions reductions.

Kumarasiri and Gunasekarage (2017) interviewed executives at 18 companies on the S&P ASX200, representing the carbon-intensive and low-carbon sector. They found that, despite the fact that companies recognise the potential for the development of renewable energy sources and low-carbon products, none of these developments induced the companies to take immediate action to improve emissions

management strategies. The authors also note the tendency of companies to use accounting techniques as a 'PR exercise' to manage their reputational risk.

The NSW Energy Savings Scheme (ESS) began in 2009 (NSW Government 2017). The ESS is a NSW-based, mandatory scheme for electricity retailers and other participants, creating financial incentives for households and businesses to invest in energy savings by installing, improving or replacing energy-saving equipment. The policy development of the ESS was jointly shared by the NSW Department of Industry (DOI) and NSW Office of Environment and Heritage (OEH).

Following the completion of the ESS Review the NSW Government introduced changes which expanded the ESS to include gas savings, increase the energy savings targets for 2016, and extend the ESS to 2025.

The Case Study here seeks to help readers understand the policy complexity of moving to a greenhouse gas reduction strategy across government and business.

## Q Case Study IV. Towards low-carbon electricity generation – Retiring Coal

The Latrobe Valley, a relatively small area 150km to the east of the major metropolitan area of Greater Melbourne, is historically the site of base-load energy production for Victoria due to the region's extensive brown coal reserves. The SECV (State Electricity Commission of Victoria) was established in the early 1920s to exploit this asset, becoming the major employer in the region, with a relatively highly-skilled (largely male) labour force numbering in the thousands, including large numbers of apprentices and technical trainees. In 1991, for example, 868 were employed in these categories providing skilled tradesmen for work in and outside the industry.

However the privatisation of the SECV and restructuring of the electricity industry in the 1990s initiated two decades of disruption, the labour force in the Latrobe Valley falling from around 8,500 in the 1980s to 1,800 by 2002. State-sponsored and State-encouraged provision in the social reproduction of skilled workforces ended, replaced by relatively uneven and *ad hoc* measures involving private providers and a stretched and beleaguered further education provision.

These changes were played out in stark ways in relation to the Hazelwood Power Station, built in the 1960s and closed in 2017. This power station was a 1,600 MW brown coal generator made up of eight 200 MW units which were constructed between 1964 and 1971. In 1986 the SEC announced a three-year plant life extension and in 1992 announced that the plant would be closed in 2005, following the planned closure of Yallourn. In 1994 a newly-elected conservative State government privatised the Hazelwood plant and in 1996 the plant was acquired by International Power for \$2.4 billion (with 92 per cent ownership, the Commonwealth Bank owning the remaining eight per cent). In 2003 the generator was rebranded as International Power (albeit still known as Hazelwood).

During the 2000s the generating companies began to see the climate change face of

successive governments. International Power were told by the State Government that the greenhouse emissions of the plant were too extensive, beyond the government's environmental effects limits. Nonetheless, to guarantee production a planned extension to mining operations was agreed. In 2003 the WWF released a report stating that Hazelwood 'is the most polluting of all power stations operating in the world's major industrialised countries.' (WWF 2003). John Parker, then Secretary of the Gippsland Trades and Labour Council, said 'I think it's ridiculous to keep a power station open that long, knowing that power stations are polluting,... I don't believe that the world will stand by and allow us to keep those sorts of power stations on-line'.

Paradoxically, in the same month the Government released its Victorian Greenhouse Strategy Action Plan Update (DSE 2005), which stated that: 'A reduction in greenhouse gas emissions is already urgent, particularly at a time when energy demand and greenhouse gas emissions are increasing. The earlier that action is taken, the more orderly will be the transition to a low-carbon future'.

During the late 2000s these concerns were crystallised by the Commonwealth government's move to implement a Contract for Closure agreement, whereby at least one generator would undergo a phased closure with compensation provided for such steps. But these negotiations collapsed in 2012, with the following statement from the relevant ministry: '...the government and operators were unable to agree on a suitable price to close down the power stations.' (ABC Gippsland, 2012).

In 2014 the then owners of the Morwell Briquette factory (Energy Brix) announced closure of the plant, with little concern for the fate of the workforce.

When a mine fire in 2014 came within 200m of the Hazelwood Power Station, then owned by GDF Suez after a merger with International Power, it took more than 7,000 firefighters 45 days to extinguish it. There followed widespread public concern about the fire and its health impact, two enquiries, and complex discussions with the company about responsibility.

## Skills for Green Jobs in Australia

By 2016 Hazelwood Power Station was the oldest coal-fired generator operating in Victoria, and not surprisingly had the highest carbon intensity of any power station in Australia at 1.52 tonnes of CO<sub>2</sub> for each megawatt hour\* (MWh) of electricity produced (as reported by the Australian Energy Market Operator (AEMO)). It emitted around 16 million tonnes of CO<sub>2</sub> every year – 14 per cent of Victoria's annual greenhouse gas emissions and three per cent nationally. It was the largest source of toxic dioxin in the country, and also of toxic fine particulate matter (PM 2.5), which causes death of an estimated 18 people every year in Gippsland. It used 27 billion litres of water a year – as much as Melbourne uses in a month (Environment Victoria, 2016).

In November 2016 GDF Suez, rebranded as Engie, announced that the Hazelwood Power Station and mine would close on 31 March 2017. Despite vigorous protests, the plant closed with well over 1,000 direct and indirect (mainly male) workers losing their jobs. The closure marks the beginning of the exit of all existing coal-fired generators from the region. Loy Yang A have announced their intention to move away from all coal-fired generation globally by 2050 and Yallourn, with its ageing infrastructure, is likely to follow Hazelwood within a short timeframe. The job losses already occurring reinforce losses from other industry closures in the region, involving timber mills and others.

The closure of the Hazelwood plant by Engie places the region in a cleft stick: is it decline and degradation as usual or is there a hopeful future, albeit some way off? With closure, the focus turns to the future of the workforce, direct and indirect, and the skills base across the region. The Victorian government immediately announced a \$22 million package of support for Hazelwood workers and established a Worker Transition Centre in Morwell in partnership with the Gippsland Trades and Labour Council, providing education, counselling, financial advice and subsidised job-seeker training for workers in transition and incentives for businesses to employ Latrobe Valley workers.

\$20 million in State funding also facilitated the establishment in Morwell of the Latrobe Valley Authority to lead the Government's

response to the transition of the workforce and the economic development of the Latrobe Valley. These measures were part of an overall \$266 million package that designated the Latrobe Valley as an Economic Growth Zone with incentives for business start-up and expansion and assistance to the Engie supply chain. The Federal Government also announced \$43 million of support overseen by a ministerial committee which included \$20 million for local infrastructure, \$3 million to assist employees and \$20 million for regional jobs and an infrastructure package.

It can be argued that the government response to Hazelwood recognised that the impact of closure would affect families and communities – perhaps drawing out lessons learned from privatisation – and ensured that all the services being offered were available to family members. However, the focus on skills transition and development was based on the assumption that the Hazelwood workforce was predominantly male, with family members and partners in supporting roles. From late 2016 there was a recognition that there were no peer support services for women and that specific instrumental packages such as updating of formal trade qualifications were aimed at the established male-dominated workforce. While such packages are of value, they are limited in any move to prepare for a post-redundancy, low-carbon world.

## Q Case Study V. Corporate Steps to a new green and inclusive business model

The Australia Gas Light Company (AGL), is iconic in that it is moving out of coal-fired energy production and committing itself to renewable energy production, with dramatic implications for workforce skilling and reskilling. AGL was created in 1837 with 'An Act for Lighting with Gas the Town of Sydney', lighting the first gas lamp in Australia in 1840. Until the late 1990s the company was a gas producer and goods manufacturer. In 1998 AGL commissioned a solar generator at Wilpeana Pond in the Central Flinders Ranges in South Australia. The station has 1,250 solar cells each with a capacity of 80W.

Increasingly the company looked for alternative sources of energy generation, thereby qualifying its position as the country's largest corporate CO<sub>2</sub> emitter.

In 2006 the Australia Gas Light Company merged with Alinta and subsequently separated from AGL Energy. The company acquired the 2,210 MW Loy Yang A power-station and the adjacent Loy Yang Coal mine in 2012. This was followed in 2014 with the acquisition of Macquarie Generation, comprising the 2,640 MW Bayswater Power Station, the 2,000 MW Liddell Power Station, the 50MW Hunter Valley Gas Turbines and the Liddell Solar Thermal Project. By 2017 AGL Energy was providing gas, electricity, solar PV and related products and services to more than 3.6 million customers in Australia and now operates the largest electricity generation portfolio in the country.

The release of AGL's Greenhouse Gas Policy in 2015 provided a pathway for the gradual decarbonisation of AGL's generation portfolio by 2050. In the same year the company released its own battery storage device and the Nyngan and Broken Hill solar plants achieved full generation, contributing 155 MW of renewable energy to the National Energy Market. In 2016 AGL launched the world's largest virtual power plant, with 1,000 connected batteries installed in homes and businesses in South Australia, giving a peak capacity of 5 MW.

AGL has major investments in hydro and wind energy generation, as well as ongoing developments in key renewable areas including solar, geothermal, biomass, bagasse and landfill gas energy. The company also operates retail, merchant energy and upstream gas businesses and has more than three million customer accounts. The range of technologies now utilised by the company include:

- Landfill gas in the Eastern States, Tasmania and Western Australia;
- Biomass in Queensland;
- Biogas in Victoria;
- Solar in South Australia and large-scale solar projects in NSW;
- Wind farms in South Australia and Victoria; and

- Hydroelectricity assets concentrated around the Victoria and NSW border.

One commercial innovation that AGL has promoted is an investment fund to develop, own and manage approximately 1,000 MW of large-scale renewable energy infrastructure assets and projects. The company contributes \$200 million in equity and seeks investment partners for the new fund.

AGL Limited has over 2,500 employees. In the changing employment world, the company has begun to focus on the recruitment and promotion of women. This industry faces skills shortages in many areas, and the labour pool for women is relatively small. At the time women comprised 46 per cent of AGL's workforce, although only 35 per cent of AGL leaders were female and the representation of women in leadership was much less at senior levels. Additionally, two of AGL's major business groups – Merchant Energy and Upstream Gas – operate in male-dominated industries and as a consequence have only a small pool of female employees (27 per cent and 22 per cent of employees respectively) relative to its Retail Energy business (59 per cent of employees) and the organization as a whole (45 per cent of employees). More than 50 per cent of roles at AGL are non-traditional roles for women under the Workplace Gender Equality Agency's definition.

The argument by the company in 2012 was that they will have a competitive advantage in the sector if they 'can successfully attract women to non-traditional roles and retain and develop them for leadership in male-dominated workplaces' (Australian Government, 2012). The company sought to increase the representation of women in leadership and achieve gender diversity across the company.

On 1 July 2015 AGL set a target of achieving a 50 per cent<sup>8</sup> female appointment rate to the Senior Leadership Pipeline<sup>9</sup> by FY2016. The female appointment rate for external appointments to the Senior Leadership Pipeline stood at 41 per cent on June 30 2016 (compared to 33 per cent of external appointments in FY2015). AGL has set a target of increasing the

## Skills for Green Jobs in Australia

number of women in the Senior Leadership Pipeline to 40 per cent (by FY2019). AGL's Board has also committed itself to achieving a target under which, by 2018, 30 per cent of the Directors will be female, resulting in a net neutral change to gender diversity on the Board.

In September 2015 AGL introduced a Domestic Violence Support Policy, which included an anti-discrimination clause, providing up to 10 days of paid Domestic Violence Leave in addition to other leave provisions, along with flexible work arrangements and access to counselling services through the Employee Assistance Programme.

TW Power Services, AGL Loy Yang Power and Baw Baw Latrobe Local Learning and Employment Network (LLEN) have provided 207 students with work experience and work placement opportunities in the six years the joint venture has been in operation. By August 2017 207 students had participated in 1,219 days of work experience while another six students participated for over 600 days in school-based Apprenticeships at the Power Station, working in the maintenance, engineering and business administration fields.

Since implementing the Students@Work programme in 2011, TWPS has provided 42 students with the opportunity to spend one week on-site working on a project which improves their team work, problem-solving and project management skills. TW Power Services has offered two students full-time apprenticeship positions in the contract on fitting, turning and boilermaking.

The joint venture represents the ongoing commitment between TW Power Services (a joint venture between Broadspectrum and WorleyParsons), AGL Loy Yang Power and LLEN to support and mentor young people throughout the Latrobe Valley region. TWPS is also a signatory to the Gippsland Youth Commitment which promotes a collaborative region-wide approach to improving education and training opportunities and outcomes for all regional youth and local economic development.

In July 2017 the company also formed a partnership agreement with Federation University with the aim of fostering innovation, education, diversification and investment in the midst of industry transition in the region. AGL's executive general manager of group operations, Doug Jackson, said that the energy company's partnership with the university would lay a foundation for working with the community to deliver economic growth in the region.

"The collaboration agreement will draw on our existing relationship with Federation University and commit to focusing on research and work to repurpose a resource-intensive region into an innovative region," Mr Jackson said. Federation University's deputy vice-chancellor Professor Todd Walker said that the university was delighted to partner with AGL to foster economic growth and develop much-needed research, education and training opportunities in the Latrobe Valley. As part of the agreement, a steering group will pioneer projects, including acceptance by AGL of post-doctoral Fellows in short-term and long-term projects and Federation University support for AGL Energy staff in undertaking education and training and higher degrees through research.

It will also include the university carrying out customised education and training programs for AGL staff and suppliers, students undertaking workplace projects or internships and a five-day Enterprise Development Programme to foster business growth and resilience.

AGL has also introduced a Lesbian, Gay, Bisexual, Transgender and Intersex (LGBTI) Inclusion Strategy. This programme has the stated goal of 'driving a cultural change where our employees feel safe, and able to contribute to business outcomes in a personally authentic way' (AGL, 2017). In brief, the company aspires to 'be recognised as an inclusive employer that incorporates LGBTI people in a leading edge diversity strategy' (AGL, 2017). In early 2016 AGL pledged support for marriage equality in Australia by becoming a corporate supporter of the Australian Marriage Equality (AME) national campaign for a change to the country's marriage laws.

In 2016 AGL was ranked 13<sup>th</sup> among the 87 employers that elected to participate in the Australian Workplace Equality Index (AWEI), and 6<sup>th</sup> amongst publicly-listed companies. Loy Yang General Manager Steve Rieniets was recognised as the Regional Inclusion Champion of the Year for his dedication to building a safe and supportive workplace for LGBTI employees based in regional Victoria. AGL also supported the 29th Midsummer Festival in early 2016, as well as the 2016 Mardi Gras Film Festival.

This Case Study seeks to illustrate some initiatives at corporate level and in a key sector for addressing GHG emissions, and how, arising from these initiatives, skills training opportunities are being pursued.

## Case Study VI. Gippsland Solar – Leader in a rapidly evolving business

*“There’s no way to sugar coat the damage that the closure of Hazelwood Power Station will do to the Latrobe Valley in the next few years. But I think most people would agree that this day would come, eventually, as the business case for Hazelwood is no longer sound. So while it’s a very tough and emotional time for many, the conversation needs to move to – what’s next?”*  
(Gippslandia, 2016)

Gippsland Solar was founded by Andrew McCarthy in June 2010 and initially focused on installing 5kW systems for households at the then 66 cent feed-in tariff, which provided a significant incentive. The reductions in government-funded rebates since then precipitated a move into the business market with customers now including local government, hospitals and care facilities for the aged. It is currently the largest supplier and installer of solar power systems in Eastern Victoria, recently installing a 330kW solar system at the Sale Hospital.

At the forefront of an evolving industry Gippsland Solar has followed the shifts in the market, with a move into battery storage. Through installation of many systems in homes, the technological

advancements mean that homeowners are increasingly being offered the choice of staying off the grid.

A natural progression from this development is the move to electric vehicles (EVs). Working with Tesla, Gippsland’s first EV public charging station was installed at Gippsland Solar’s showroom in Traralgon. With EVs soon entering the market costing less than \$50,000 it is estimated that by 2025 there will be around 200,000 EVs on the road. Andrew is optimistic that the market will grow rapidly and sees potential in the Latrobe Valley for developing manufacturing and recycling in battery technology, taking advantage of the shift towards renewable energy.

While there is optimism regarding the growth of EVs, in 2016 the Australian Energy Council reported a fall in the sale of EVs for the first time, leading to debate about the lack of government incentives to encourage the transition to green vehicles. EV car sales in Australia represent 0.05 per cent of new car sales. Reductions in registration and tax, waivers on road tolls and ferries and access to bus lanes are some of the incentives offered in Norway and the Netherlands with the two highest market shares. Low petrol prices may also have led to the slow growth in sales.

Market forces alone may not be able to overcome the reluctance of Australia to switch to EVs. While the Finkel review highlights the importance of EVs in achieving significant emissions reductions in the transport sector, incentives and flexible regulation may be needed to achieve this. Gippsland is a region which is experiencing perhaps the greatest impact from the move away from coal-fired power generation in Australia. While training and skills investments will help with the transition, it is clear that without new industries in the region, unemployment levels will remain very high. The Gippsland Solar case shows that even in a region which is seeing large-scale job losses from the retirement of ageing coal-fired power stations, there are encouraging initiatives in renewable energy.

## Q Case Study VII. Delivering solar electricity to low-income residents: Stucco Housing Cooperative and Sun Tenants

Stucco Housing Cooperative, a low-income student housing provider, installed the first solar storage system in an Australian apartment block in 2016. The project installed 30kW of solar panels and 36 batteries with 42.3kW of storage capacity. The project received an \$80,000 Environment Performance Innovation Grant from the City of Sydney Council, and up to \$130,000 in pro-bono legal advice from Gilbert and Tobin Lawyers. The Housing Cooperative's legal structure meant that the residents were in the unique position of being both residents and landlords. The project took 18 months to satisfy regulatory questions including fire requirements. The Cooperative found that the regulator emphasised consumer choice at the expense of allowing the development of small-scale, low-cost solar solutions. The Cooperative had to form its own electricity company and apply for an exemption from the need for a retail licence. The installation of the photovoltaic solar cells and battery system took 2½ days. The Cooperative estimates that the solar installation cut the cost of electricity for residents by one-half.

SunTenants arose out of a community development project with the low-income student housing provider Stucco Housing Cooperative in Sydney, NSW. SunTenants is a social enterprise aimed at providing solar electricity to rental tenants. Rental tenants are underserved within the Solar PV market. Home ownership is the key factor influencing the ability of consumers to install solar PV (Sommerfeld and Vine, 2017). SunTenants, led by engineer Bjorn Sturmborg, have developed a financial model to convince landlords to invest in solar technology and sell the electricity to tenants. Landlords are motivated by an interest in climate change, in increasing the value of property, and in realising value by selling electricity to renters. The company collaborates with a design firm, Shinehub, which specialises in bulk design of solar systems, and with installers.

As regards skills dimensions, the biggest barrier to development was the availability of qualified installation electrical technicians. In their view the market is saturated with demand for solar systems, but because solar systems entail a once-for-all sale, electricians with Climate Energy Council accreditation are limiting market development. Overcoming the threshold for green skills accreditation remains an ongoing challenge for this organization.

## Q Case Study VIII. Indigenous green skills: Warddeken Indigenous Protected Area, Northern Territory

The Warddeken Indigenous Protected Area (IPA) consists of approximately 1.4m hectares of stone and gorge country in West Arnhem Land, Northern Territory (NT). The West Arnhem Land Fire Management Project (WALFA) is a partnership between Aboriginal traditional owners and indigenous representative organizations, Darwin Liquefied Natural Gas (DLNG), and the Northern Territory Government.

The WALFA project was registered by ALFA (NT) Limited as an Eligible Offsets Project in 2014, viz.:

*The purchase of (W)ALFA generated ACCUs supports Aboriginal people in returning to, remaining on and managing their country, the protection of biodiversity, the preservation and transfer of knowledge, the maintenance of Aboriginal languages and the wellbeing of traditional custodians. (Carbon Market Institute 2017)*

From 2009 to 2016 approximately 253 Indigenous people (53 per cent men, 47 per cent women) have been employed on the IPA, conducting activities including fire management, feral animal and weed control, and monitoring of threatened species.

One of the key outcomes of the project has been the increase in technical skills in the community. Technical skills are defined as Traditional Ecological Knowledge (TEK) and Western scientific knowledge. TEK is gained through learning from older people in the

community (Senior Rangers and community elders). Western scientific knowledge is gained through undertaking TAFE courses in subjects such as conservation and land management, chemical application and fire management (SVA 2016). Senior bininj rangers are now trained to use incendiary equipment, GPS, CyberTracker and real-time on-board mapping equipment (Warddeken 2010). Warddeken also provides training in documentation, analysis, reporting and administration.

Other economic benefits reported by SVA consulting include increased confidence and better health and well-being. These benefits are related to the strong cultural focus of the project, which offers participants the opportunity to learn new skills, spend time with community elders, and connect to culture and landscape.

The project has achieved 901,075 tonnes of CO<sub>2</sub> in carbon abatement worth \$4.4million (Carbon Market Institute, 2016).

## Q Case Study IX. Carbon Neutrality, a skills challenge?

Policy often follows practice. In 2011 the Australian government implemented the 2011 Carbon Credits (Carbon Farming Initiative) Act. This Act encouraged farmers to promote land management change either to reduce carbon emissions or to sequester carbon. It accompanied the contested 'emissions trading scheme' introduced in 2011 by the Australian Labor Party with support from the Australian Greens. This scheme placed a price on carbon emissions, and was subject to bitter and ultimately successful opposition from the conservative coalition. After a change in government, the CFI was transformed into the Emissions Reduction Fund (ERF), providing financial incentives to reduce emissions. Carbon Credit Units are earned for every tonne of CO<sub>2</sub> equivalent, either stored or avoided.

The beef cattle industry in Victoria is extensive. In 2012-13 the gross value of the industry was around \$1.3 billion. Production is increasing, 459 kilotonnes (kT) of beef and veal being produced in 2012-13, up from 369kT the previous

year. It is Victoria's most geographically extensive industry. It is a key element in the export trade, the value of Victorian fresh, chilled and frozen beef and veal exports increasing from 2012-13 by 55 per cent to \$1.0 billion in 2013-14, 14 per cent of the Australian total of \$7.2 billion (source: Department of Economic Development, Jobs, Transport and Resources (2014) Beef Industry Profile, December 2014). The average Victorian beef farm area is 340 hectares and in 2012-13 there were 15,252 agricultural business carrying 2.4 million beef cattle. Approximately 14,494 people were employed on properties engaged in beef cattle production, with 7,709 in the specialised beef cattle industry. The meat processing industry employs around 9,000 people, and 3,476 were employed in abattoir and meat packing facilities (same reference as above).

Australian agriculture accounts for around 16 per cent of national greenhouse gas emissions and of this a total of 70 per cent in CO<sub>2</sub> equivalent can be attributed to methane emissions. Two strategies to address this situation are possible, assuming an on-going commitment to beef cattle production: first, steps can be taken to reduce methane output and, second, methane emissions can be offset by carbon sequestration methods. Taken together, these are the steps towards achieving carbon neutrality in beef cattle production.

In recent years policies related to carbon neutrality and carbon farming have been promoted by governments to mitigate the effects of climate change. "Carbon neutrality" is the outcomes of seeking to remove as much CO<sub>2</sub> from the atmosphere as is put into it. This is usually achieved by implementing projects that offset the level of carbon emissions. Such claims for carbon neutrality require rigorous calculation, transparent accounting and verification to confirm that net emissions equal zero.

To illustrate how carbon neutrality in relation to beef cattle production may be achieved, two aspects are considered, *via* a review of one couple's long-term commitment to creating the most favourable conditions for such production. First, the two beef producers took steps to minimise methane output and, second, they

## Skills for Green Jobs in Australia

created the conditions for offsetting carbon emissions. They displayed a willingness to learn and experiment (and to make mistakes) so as to achieve appropriate outcomes, and they consciously sought to develop their skills *via* advice, guidance and example on different approaches to the achievement of carbon neutrality.

On 10 July 2014 Bob and Anne Davey were able to declare their 145.7 hectare beef cattle farm on Philip Island, Victoria, carbon neutral, “the first beef cattle farm (in Australia) to do so” (Bill Hampell (2015), *Against the grain*, Dural, NSW; Rosenberg Publishing: 56). Their first concern in the 1980s was to address soil productivity (addressing a salinity problem), and they began to plant thousands of trees and seek scientific advice on soil health. Over time they introduced other carbon-fixing measures through targeted legume planting and low till approaches to soil care. Complementing these approaches they also took steps to minimise methane output and create positive conditions for cattle raising and handling, such as rubber walls on cattle runs, recycling of silage wraps, and sustainable power. Overall, this approach is one that combines productivity with conservation, drawing on associations such as Landcare (a community-based movement from 1986 addressing environmental problems, there are just under 600 such groups in Victoria alone) as a learning organization, combining science, experience, voluntary commitment and government support. They also benefited from long-term external wage support, from Anne, apparently an important condition in this process.

This achievement illustrates the ways in which carbon neutrality on farms is the outcome of a thoughtful and reflexive approach to land management and animal care. First, it is important to develop a coherent narrative of change and innovation whereby the approach is predicated on the understanding that there is no magic solution to the practical challenges facing beef cattle production on large areas. Second, there should be a willingness to learn and experiment, such that farming is recognised as a *de facto* collective enterprise involving farmers, service providers, scientists, volunteer environmental actors, and State agents. Third,

programmed change will inevitably involve a wide range of social actors undertaking mundane tasks (planting trees), learning from each other (field days) and promoting exchanges (sharing diverse experiences). Fourth, skills development and awareness underpins these processes so that complex and innovative practices can be introduced and utilised, for example planned pasture rotation and management. Fifth, these steps towards skilled and accomplished stewardship of the land should be informed by rigorous accounting and monitoring procedures in relation to land management and animal care in the form of comprehensive and manageable databases.

## Q Case Study X. Sustainable Water Management – Australia’s Murray Darling River Basin Plan

The Murray Darling Basin Plan is a coordinated approach to water management across the Murray–Darling Basin’s four States (South Australia, Victoria, New South Wales and Queensland) and the Australian Capital Territory. It aims to facilitate the management of the Basin’s water for the benefit of all its users and the environment by determining the amount of water that can be extracted annually from the Basin for urban, industrial and agricultural consumption in such a way as to have no negative impact on the natural environment including the functions of the rivers, waterways, groundwater and wetlands of the Basin. Beyond controlling water use, the Plan aims to ensure good-quality water and its efficient use (see <https://www.mdba.gov.au/basin-plan/whats-basin-plan>).

Research completed this year by the Gender, Leadership and Social Sustainability Research Unit (GLASS) at Monash University highlights the social sustainability issues inherent in managing environmental challenges. It identifies key themes in managing the water Basin Plan, including the central importance of fairness, trust, and equity issues, and particularly gender equality. Farming is a male-dominated industry. It is clear that as farming structures

change to adapt to water restrictions the impact of these changes is differentiated by gender considerations. There are implications for the gendered divisions of labour, roles and responsibilities across the communities involved. Findings include the following:

- Smaller farms are increasingly reliant on off-farm income, most often from women;
- As larger farms develop (as result of the water use changes) women are working more on the farm, often in dairies; in particular women are increasingly used as an unpaid workforce, working on-farm to reduce labour costs, for example in milking and livestock management;
- Currently the focus is on development of male farmer-manager roles, for example in water trade, staff management and decision-making; there is a need for opportunities for women to be addressed in the dairy industry, including leadership development;
- There is a need to take advantage of women's knowledge: many women undertake the farm enterprise's financial administration and are critically aware of increased water costs due to reduced availability of water for consumption or irrigation use, and the management of debt associated with farm redevelopment.

Recommendations include the following:

- Water policy needs to incorporate local community perspectives, needs and opportunities, including those of women farm workers, family and community members.
  - Dairy industry practices supporting gender and social equality require further needs assessment but this research indicates the need for further gender analysis and gender mainstreaming in water policy processes (linked to our gender mainstreaming strategy section in the report). This should include on-farm roles and responsibilities, training opportunities, opportunities to participate in decision-making (on- and off-farm), and succession practices.
- The report recommends the following as essential for assisting and supporting social sustainability in dairying communities:

- Childcare;
- Communications, public transport, education and school options, livelihood opportunities;
- Trust building in water governance reform and infrastructure programme rollout;
- Inclusive policy development and policy nexus strategy that can support rural community- and location-based adaptive capacity.

## Q Case Study XI. Environment Institute of Australia and New Zealand – Learning to Adapt

The Environment Institute is a not-for-profit, professional association for environmental practitioners in Australia and New Zealand (EIANZ). The Institute supports environmental practitioners and promotes independent and interdisciplinary discussion of environmental issues. The Institute also advocates environmental knowledge and awareness, advancing ethical and competent environmental practice. Its members come from all areas of environmental practice and are at the forefront of challenging and complex issues such as climate change, sustainability and preservation of biodiversity.

Learning to Adapt is EIANZ's climate change adaptation professional development programme for established environmental professionals delivering practical, hands-on skills and knowledge at postgraduate level. The programme provides leadership to a broad range of professionals by bringing together leading scientists, regulators, policy developers and business people to discuss approaches to climate change risk and adaptation measures. The fora provide a unique opportunity to understand what is happening in highly segmented areas and the necessity for a cross-sectoral approach.

In recognition of the evolving space, Learning to Adapt has moved from discussion and information updates to providing skills development and training on climate change risk assessment, legislation and regulation, climate change impacts and carbon management.

## Q Case Study XII. Green Skills and Bushlink – People Living Disabilities

Green Skills is an organization that develops and manages environmental and community projects across the city of Perth and regional Western Australia (notably in Albany and Denmark in the south-west). Green Skills is a driver of change towards a more sustainable community. Its mission is to promote and demonstrate sustainability in action through creation of employment opportunities and the provision of training, research and on-the-ground projects. Green Skills is an incorporated not-for-profit organization and runs successful enterprises such as our Ecojobs teams, Tip Shop operations and Professional Consulting services to support our vision. Green Skills has partnered with Karrak Consulting to develop a number of successful leadership programmes for regional community leaders.

GreenSkills has a programme of nature-based activities for people living with disabilities. The programme is delivered in conjunction with local wildlife providers WA Birds of Prey and Radical Reptiles. Interactive sessions focus on conservation, wildlife rehabilitation and environmental education. Participants also have opportunities to handle the wildlife if they wish. GreenSkills has established relationships with disability support agencies in Perth who recognise that nature inclusion improves the well-being of people living with disadvantages and of their carers.

Bushlink is an innovative employment programme for people with disabilities, based in the northern suburbs of Sydney. The programme was established by Northside Enterprise Inc. in January 2009. The Bushlink team is made up of a supervisor and a small team of people with disabilities. Bushlink is available for gardening and bush regeneration services around the Northern Beaches of Sydney. We are also available to run 'Corporate Volunteering Days' for your business or organization. Since 2012 Bushlink has been working regularly on Lionel Watts Reserve to regenerate the bushland. With threatened species (*Grevillea caleyi*) on

site, the focus has been on the remnant seed bank and what lies beneath. Bushlink has been raking plots and hand-weeding areas to create a disturbance so as to stimulate growth. Bushlink has also been working on a project since 2012 to restore the Orara Reserve in partnership with The Beach School, The Sisters of Charity Foundation and the Save Manly Dam Catchment Committee. The Bushlink teams restore remnant bushland in the core area of good bush in which noxious and environmental weeds are scattered throughout. Including Fishbone Fern, Lantana, Cotoneaster and Pampas Grass among others, this Open Eucalypt Woodland or Forest has an area of the threatened species *Acacia terminalis subsp. terminalis*. The aims of the work are to improve the resilience and biodiversity of the site, to work with the disengaged students who attend the Beach School, and to promote positive attitudes to the school within the local community.





ISBN 978-92-2-132905-3



9 789221 329053