

CHAPTER 3.

SKILLS DEVELOPMENT IN THE GREEN ECONOMY

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Abstract

This chapter analyses strengths, weaknesses, opportunities and threats arising from the way in which public and private agencies in Sydney identify skills needs and deliver skills training to prevent skills gaps from hindering business opportunities in the developing green economy. It uses a skill ecosystem framework for the analysis. The chapter finishes with four recommendations arising from the analysis and suggests a case study from outside Australia as a practical example supporting each recommendation.

Policy issues

In Australia and internationally there is considerable concern that skills gaps in the labour force will create problems for private businesses and national governments responding to business opportunities and policy issues arising from ‘the green economy’⁶⁶. The following concluding paragraph of a summary statement from the House of Commons Environmental Audit Committee (2009, p. 3) expresses this concern well:

Relying exclusively on the market to address skills gaps is causing delays in greening the economy. The demand-led approach to skills has not worked because employers are unable effectively to articulate their needs to the skills delivery bodies. The Government’s new skills strategy must prioritise the skills needed to drive the economy through the low-carbon transition. A body to lead the green skills agenda must be found and low-carbon skills need to be integrated through the whole skills delivery system to encourage behavioural change across the entire economy.

The response in the United Kingdom was to launch, at the end of March 2010, a consultation on “meeting the low carbon skills challenge” identified in the base document as comprising five key elements for employers, the skills system and Government (Low Carbon Skills Team, 2010, p. 4):⁶⁷

- delivering significantly higher volumes of generic STEM skills [skills in Science, Technology, Engineering and Mathematics] at all levels;
- developing and delivering rapidly the specialist skills solutions that will be needed for emerging sectors and technologies;
- getting more young people and adults interested in low carbon careers, skills and qualifications;
- stimulating employer demand for and investment in low carbon skills; and
- replicating good practice rapidly in each of the above, within and between emerging sectors.

The same challenge has been recognised in Australia, with a strong focus on these and other elements such as workforce development, retraining and strengthening the capabilities of the country’s vocational

education and training systems to deliver skills for sustainability that are relevant to the needs of industry. In 2009, for example, the Australian and state and territory governments entered into a Green Skills Agreement based on a shared understanding that “decisive action is needed to support Australia’s transition to a sustainable, low-carbon economy” (COAG, 2009, p. 2). That agreement offered a broad definition of ‘skills for sustainability’ or ‘green skills’ (idem):

Skills for sustainability, also known as green skills, are the technical skills, knowledge, values and attitudes needed in the workforce to develop and support sustainable social, economic and environmental outcomes in business, industry and the community.

A recent study of six European countries (Denmark, Germany, Estonia, Spain, France and the United Kingdom) has highlighted the role that regions are playing in addressing challenges of this nature (CEDEFOP/ILO, 2010, pp. 11-12):

One clear finding is that efforts to identify skill needs for jobs in a low-carbon economy have been taken most prominently by the regions, in cooperation with other partners – industry and educational bodies, such as universities and vocational institutions. In four of the Member States examined, Denmark, Spain, France and the UK, regions are playing a primary role in identifying skills needs for jobs in a low-carbon economy. Regional actors are well placed to identify local strengths and weaknesses and can bring together key players such as industry, research institutes and educational facilities to provide appropriate responses.

This experience is also apparent in Australia. The State of New South Wales has been a leader in this field (see BVET, 2009). In 2005, the NSW Board of Vocational Education and Training (BVET) commissioned research on the skills required for sustainable business development, which informed the release of the first edition of *Skills for Sustainability* in 2007. This was followed, in March 2008, by the *NSW Green Skills Strategy*, implemented by the NSW Department of Education and Training. Later that year, the Board provided funding to identify, develop and assess training service models for skills development relevant to the financial services, logistics and creative industries sectors. The second edition of *Skills for Sustainability* was published in 2009. This identified four fronts where skills are central in driving and enabling environmental sustainability (BVET, 2009, pp. 12-13).

Leadership – industry and enterprise leadership is required to develop innovative business culture and practice under new commercial and legislative imperatives, using new management skills to ensure that responses to environmental drivers are examples of best practice and will bring competitive advantage to business.

Innovation – new ways of thinking about business models, production and processes and the delivery of excellence in new products and services.

Processes – more efficient production, supply chain management, marketing and delivery of goods and services.

Technical application – the provision of new technology by management requires a workforce with knowledge and skills ready to embrace new processes, install and maintain new technology.

Against that background of innovation and leadership, this chapter analyses strengths, weaknesses, opportunities and threats arising from the way in which agencies in Sydney identify skills needs and deliver skills training to prevent skills gaps from hindering business opportunities in the developing green economy.

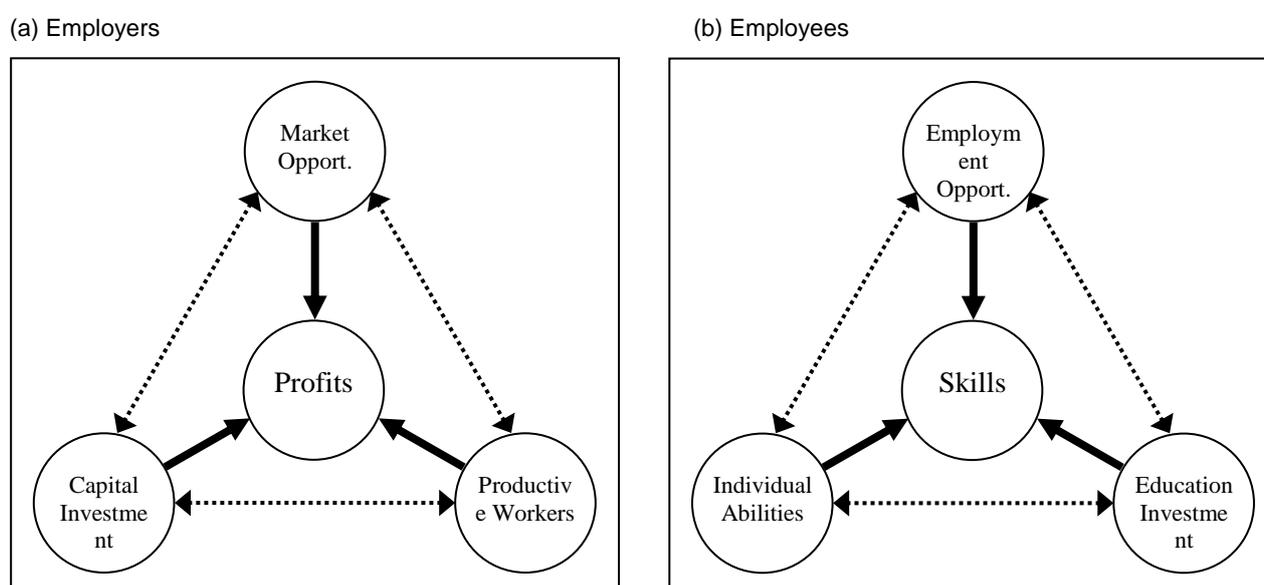
Framework to analyse Sydney's Skill Ecosystem

The New South Wales Department of Education and Training has developed a useful framework for analysing regional systems of skill needs identification and skills training, based on the concept of a “skill ecosystem”⁶⁸. The advantages of using the skill ecosystem approach have been well described by Skills Australia (2010, p. 53):

The term ‘ecosystem’ captures the notion of an intersecting and mutually reinforcing equilibrium between skills supplied by the training system and skills demanded and applied in workplaces. While this equilibrium can be understood at the enterprise level, an industry approach goes beyond finding solutions to specific problems to promote broader industry capability to plan and manage skill development. This approach offers the potential to engage, influence and share learning among large numbers of enterprises. It also positions industry to develop a critical mass of workforce development activity that is mutually reinforcing and sustainable.

Figure 12 presents two perspectives within a skill ecosystem. It begins in Figure 12(a) with the perspective of employers, who are motivated by market opportunities. When market opportunities are matched with appropriate capital investment and the employment of productive workers, this creates profits that are necessary for the enterprise to be sustainable and to generate funds for on-going investment in new technologies and skills. Figure 12(b) presents the perspective of employees. To develop marketable skills an employee needs to invest in education and training in a way that matches his or her personal abilities and employment opportunities.

Figure 12. Perspectives in a skill ecosystem

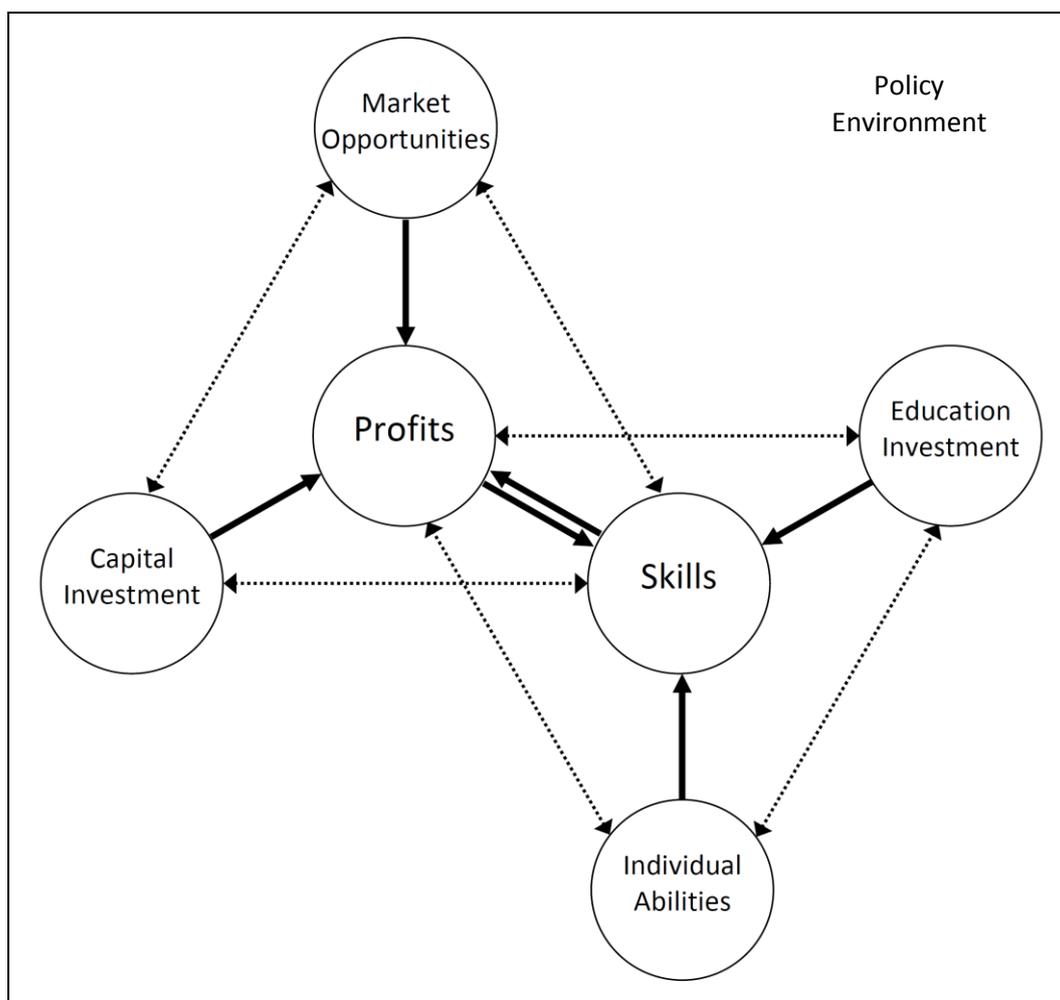


Source: Dalziel (2010a and 2010b)

Figure 13 brings the two components together into a single diagram. It recognises that it is the employer’s profits that give rise to employment opportunities and that it is the employee’s skills that define productive workers. Thus profits and skills reinforce each other at the core of Figure 13. The figure also recognises that a skill ecosystem must be led by market opportunities and must be founded on the individual abilities of the labour force, all within a wider policy environment. These features are well recognised in the international literature on skills development in the green economy. The House of

Commons Environmental Audit Committee (2009, p. 10), for example, emphasised the importance of the Government providing “business and industry with enough detail about the changes that need to be made in a way that would enable them to secure sufficient investment against clearly achievable business plans”. CEDEFOP/ILO (2010, p. 14) argues that in Europe “core skills – including STEM skills – need to be improved at secondary and tertiary levels, as they provide the basis for high-level low-carbon skills”.

Figure 13. Skills and profits in a skill ecosystem



Source: Dalziel (2010a and 2010b).

Finally, Figure 13 illustrates the coordination problem, in which employers are making capital investment decisions separately from the education investment decisions of current and potential employees. This separation means that employers can be constrained (at least in the short-run) by skill gaps in the labour force, while potential workers can waste time and financial resources by investing in education that is out-of-date or produces skills for which there is no employer demand. One of the major purposes of the policy environment within which the skill ecosystem sits is to address this coordination problem.

The VET Sector in Sydney

TAFE NSW provides a comprehensive range of vocational education and training (VET) in Sydney with more than 500 000 enrolments annually.⁶⁹ It operates through ten Institutes, four of which are based in the Sydney metropolitan area⁷⁰: Northern Sydney Institute (50 424); South Western Sydney Institute (73 069); Sydney Institute (73 359) and Western Sydney Institute (47 407). All four metropolitan institutes are involved in providing skills training for sustainability and each offers leadership in different areas of this training. An example from each institute can illustrate this leadership in skills training for the green economy.

- The **Sydney Institute** has established a Sustainable Hydraulic Trade Centre at its Randwick College campus, funded by an AUD 6.4 million grant from the Federal Government's Education Investment Fund (EIF). The Centre allows training in best practice green building skills to be delivered with a focus on hydraulic trades, including waste water treatment and reuse, evacuated tube water heating and rain water harvesting.
- On 1 November 2010, the Green Skills Hub facility was opened at the Nirimba Precinct of the **Western Sydney Institute**. This facility is a Living Laboratory designed to model sustainable practices and provide innovative training in the subject areas of green electrical engineering, plumbing, refrigeration and information technology. It was funded under the Federal Government's Training Infrastructure Investment for Tomorrow initiative.
- In August 2009, the **Northern Sydney Institute** obtained a Federal Government grant to expand an onsite water management scheme at its Ryde College. Specialised training activities ensured that ecologically sustainable developments, such as water sensitive landscaping design, were incorporated into the project. The Irrigation Training Facility was completed in July 2010, providing a water reticulation system to facilitate a simulated working environment for students.
- The refurbished **South Western Sydney Institute's** Macarthur Building Industry Skills Centre (MBISC) opened for students in July 2010 as a result of an AUD 9.9 million grant from the Federal Government's Education Investment Fund. It is a centre of excellence in building industry trade training, using an integrated project-based approach to skills development. The MBISC delivers green skills training with a focus on eco-friendly building techniques and sustainability.

These four examples are not randomly chosen; in each case the example has involved a substantial capital investment incorporating the latest "green technologies". In terms of Figure 13, this brings together the capital investment and the education investment components of a skill ecosystem, with a number of important benefits:

- educators in the institute are able to engage with the green technologies during the construction phase, upgrading their own knowledge and skills in the process;
- students in the relevant programmes are able to learn skills for sustainability in hands-on courses using state-of-the-art technologies;
- the institute is able to design a curriculum of skills that is directly connected to the new technologies the students will be using in the workplace;
- the institute is able to demonstrate to employers in the industry the potential benefits (financial and marketing) of adopting green technologies; and

- the institute is able to enter into partnerships with industry leaders who are in the vanguard of supplying, developing or adopting the latest green technologies.

These initiatives are embedded in a wider institutional commitment to sustainability within the TAFE Institutes. The Northern Sydney Institute, for example, has adopted an environmental policy committing it “to establishing, promoting and maintaining a culture of environmental responsibility, both within the Institute and in the wider community” (NSI, 2009). This Institute has been accredited with ISO 14001 for Environmental Management Systems, observing on its website that it is the only TAFE institute to achieve and maintain this international standard. The Sydney Institute publishes a “Sustainability Report Card” on its website (Sydney Institute, 2010), which includes highlights such as the establishment of green skills forums and projects to work with industry, annual reductions in its environmental footprint and the creation of new training facilities for workers in the green economy. The Western Sydney Institute has published an environmental sustainability commitment statement that sets out twelve commitments to practise and demonstrate environmental sustainability in all aspects of its business (WSI, 2009).

The institutes have taken steps to identify sustainability skills demanded by industry. The Sydney Institute, for example, has a public webpage dedicated to profiling its “green skills and sustainability skills”⁷¹. This offers 59 sustainability skills courses and another 129 courses that include sustainability skills modules. The sustainability skills courses are offered in five areas: building and construction; electronics and communications; information and communication technology; property services; and transport and logistics. Similarly, the Northern Sydney Institute has published a three volume set of reports on “Education and Training for Sustainability” detailing an overview of the institute’s capabilities and achievements, what it offers in the form of industry focussed and enterprise specific courses, and snapshots of achievements by its staff and students. Box 6 offers a case study of how the Northern Sydney Institute partnered with a major national retail chain in Australia to design a sustainability skills training programme for the retailer’s staff.

Box 15. Industry partnership for sustainability skills training

Bunnings Warehouse, a large hardware chain in Australia requested TAFE NSW Northern Sydney Institute to provide sustainability training for its retail staff, with a focus on water; power and lighting; waste management, recycling and composting. This would enable their staff to give advice to customers on sustainable solutions to their household and business building and gardening projects. The training programme was called “Sustainable Solutions”.

Prior to delivery, NSI training team members worked closely with Bunnings Warehouse staff in the development of the programme to ensure their environmental policy and sustainability approach was consistent in the training materials and the range and nature of the products sold by Bunnings Warehouse related to the course materials and delivery methods.

During 2010, in partnership with Bunnings Warehouse, NSI with the NSW TAFE Centre for Learning and Innovation (CLI) produced an online ‘Making Sustainable Choices’ training programme modelled on the face-to-face pilot programme. This is now being rolled out to 32,000 Bunnings Hardware staff across Australia and is a significant contribution to the development of green skills for the retail hardware sector. Bunnings Hardware staff provided a list, for the online programme, of the top 10 questions asked by customers in regard to sustainability/sustainability product options. The answers to these questions were included in the product content to ensure that all Bunnings team members were equipped to answer them when asked.

The programme consists of four primary topic areas: Sustainability, Water, Waste and Recycling and commences with a knowledge quiz to test the participants’ current knowledge about sustainability in general and questions relating to the topic areas contained within the programme. Once participants have completed the quiz, they are guided through the four topic areas. Audio is provided over each of the slides in the presentation. The option to read the transcript is also provided for those with a visual learning style.

This training case study highlights the need for training providers to work closely with industry partners to establish their sustainability training needs, to make the programme relevant and contextualised for their organisation and to trial and pilot the programme for feedback and improvement.

The Garnaut Climate Change Review made the following comment about the importance of education and training in the face of climate change (Garnaut, 2008, p. 586):

The structural changes that will emerge in a low-carbon emissions, growing economy will change requirements for human capital. In Australia, a history of skills development has been inherent in a globally successful resources sector. Australia should be structurally well placed to apply such skills to new activities.

The examples discussed above suggest that the best of the TAFE programmes in Sydney do indeed reflect Australia's traditional strength in skills training and clearly represent international best practice, although there are always questions about whether such initiatives are demand-driven (especially by industry) or supply-driven (responding to specific funding opportunities from federal programmes). Under federal legislation, all Australian based companies with energy consumption of more than 0.5 PJ per annum are required to report on energy use and energy savings under the Energy Efficiency Opportunities Program. Hence these companies have established systems and training to improve energy efficiency, resulting in a reduction in carbon emissions, but many large firms rely on in-house and specialist training organisations rather than using TAFE programmes. Smaller companies are not subject to the same requirements, so there may be a role for partnership networks made up of regional development agencies, local government agencies and TAFE Institutes to address this universal issue.

Analysis of Sydney

This section explores the ideas of the previous section further by providing an analysis of the strengths, weaknesses, opportunities and threats faced by Sydney agencies in identifying and addressing skills needs for sustainability.

Strengths

Supportive framework at the federal level

The Australian Government recognises the importance of training for the workforce that includes skills for sustainability. It has entered into a formal agreement with state and territory governments “to build the capacity of the vocational education and training (VET) sector to deliver the skills for sustainability required in the workplace and to enable individuals, businesses and communities to adjust to and prosper in a sustainable, low-carbon economy”⁷². The federal framework for assuring quality and relevant training in skills for sustainability is well established⁷³. Industry Skills Councils, whose role is to identify and respond to the skilling needs of their industries, have proposed three guiding principles for workforce training in environmental sustainability: it should be industry specific; it should be appropriately timed; and it should add value⁷⁴. Within that framework of principles, the Industry Skills Councils have made the following observations⁷⁵:

Nearly all ISCs have designated a staff member to oversee environmental sustainability activity and extensive work is in process for the development of new units and qualifications. All Training Package reviews currently underway or planned now incorporate an analysis of environmental sustainability considerations for skill and knowledge development. Extensive stakeholder consultation mechanisms are in place across the board to ensure that ISCs have the latest industry intelligence to inform a strategic response. The ISCs are confident that effective measures to address environmental sustainability in the workplace are well in hand when it comes to Training Packages.

Supportive frameworks at the state and local levels

The Government of New South Wales has adopted a vision for the state's economy that it will be technologically advanced, highly innovative and creative, leading in low carbon approaches and globally competitive (Government of New South Wales, 2010, p. 3). The City of Sydney has been working since 2008 to implement a Sustainable Sydney 2030 strategy based on a vision of a green, global and connected city by 2030 (City of Sydney, 2010). These high-level strategies have been supported by initiatives to strengthen skills training for sustainability, including major reports from the Green Skills NSW Taskforce (2009) and the Board of Vocational Education and Training (BVET, 2009). Subsequently the NSW Department of Education and Training showcased 2010 as "the Year of Learning for Sustainability". It offered awards for outstanding achievements under this theme, at the same time as it was already working with training providers to increase their capabilities under the TAFE NSW Education for Sustainability Action Plan 2007-2010. State Training Services (part of the NSW Department of Education and Training) now provide funding for: energy efficiency and other green skills courses; professional development for trainers and assessors, and registered training organisations; and in some cases, the development of training resources or training support activities.

The Innovation Council in New South Wales has commissioned a study into specific business opportunities in a low carbon economy. The project is intended to identify and define growth opportunities across eight industry areas: grid solutions, green buildings, waste conversion, low emissions vehicles, solar, wind, geothermal energy and business services.

Advanced higher education, TAFE and private training institutions

Sydney has five universities based in the city: Macquarie University; University of New South Wales; University of Sydney; University of Technology Sydney; and University of Western Sydney. These universities offer a wide range of research and education programmes relevant to skills for sustainability. The previous section of this chapter has described some of the recent developments and achievements in the four metropolitan TAFE Institutes of Sydney. This has included significant federal government investment in state-of-the-art training facilities, such as the Sustainable Hydraulic Trade Centre at Randwick College, the Green Skills Hub facility at Nirimba, the Irrigation Training Facility at Ryde College, and the Macarthur Building Industry Skills Centre. Evidence gathered during the study visit shows the critical role that is being played by 'green skills champions' among the managers and staff of the four metropolitan TAFE Institutes, driving forward developments in learning for sustainability. As well as these public institutions, private registered training organisations have emerged to offer generic and tailored courses in skills for sustainability.

Taken together, the large number of these institutions provides a strong infrastructure in Sydney for training in skills for sustainability. It means the city has sufficient critical mass that could be leveraged to create a national and international profile for its expertise in this form of training. To build on this critical mass, the physical infrastructure must be matched with teaching capabilities that are relevant to the genuine market opportunities of the city's industries and enterprises.

Weaknesses

Low local flexibility and fragmented demand

Because Australia has a strong federal framework for setting training standards, this can have the unintended consequence of stifling local flexibility to meet emerging training needs demanded by a local cluster of employers. In particular, State training programmes can fund only competencies recognised in the National Skills Framework. There is a reasonably straightforward process for registering an emerging

skill competency for development into a certified standard, but this takes time and can be a barrier to innovation by a TAFE Institute wanting to meet (or perhaps encourage) industry demand. The recent “Emerging Technologies Project Report” included many comments along the lines of “Industry continues to be critical of the lack of flexibility in the training system, which was identified as an impediment to emerging technology skills development⁷⁶”.

The significance of low flexibility is reinforced by what is termed “fragmented demand” by industry for training in particular skills. It is rare for an industry sector to demand a new skill across the board; it is more common for a small number of firms to begin trialling an emerging technology and discovering in the process what new skills are required for its staff. Flexibility is important if training providers are to be able to respond to fragmented demands of this type. More generally, flexible delivery, cost effectiveness and a partnership approach to designing programmes that strengthen enterprise competitiveness will be important in stimulating demand for training by businesses.

Weak professional development of Institute staff

The “Emerging Technologies Project Report” further commented that “the VET sector must ensure that in implementation, trainers and the equipment and other resources they use are up to speed with emerging technologies⁷⁷”. There are resources available for training the trainers in sustainability (for example, the programmes offered by the National Centre for Sustainability at the Swinburne University of Technology and the “Green Skills for Vocational Education and Training” workshops offered by the NSW Department of Education and Training). Nevertheless it can be difficult to obtain resources for releasing staff for professional development. Consequently, while some educators in the TAFE NSW system are acting as champions in promoting training in sustainability skills, it can be difficult to engage other staff members. One Institute, for example, found that about 12 % of its staff completed an on-line training facility that had been made available for everyone to help develop sustainability competencies. This may indicate a low level of interest among some staff or it may suggest that other methods of delivering professional development in this area are required. Without effective up-skilling of the trainers, students in some programmes may not be introduced to the latest sustainability skills technologies and practices due to gaps in the knowledge of their educators.

Low take-up by SMEs

It is well recognised internationally that small and medium-sized enterprises (SMEs) find it difficult to access training opportunities for their staff. They are less likely to have a dedicated human resource manager and it is harder to release staff for off-site training. They are also more likely to want custom-designed and specific skills training rather than generic and broad training. There are policies that are attempting to address this issue for sustainability skills training. Enterprise Connect, for example, is a Government programme that provides support to eligible Australian small and medium-sized businesses. A key element of the programme is the Clean Technology Innovation Centre, which offers a range of business and advisory services⁷⁸ for SMEs in the clean energy sector. At the State level, Sustainability Advantage is a business support service from the Department of Environment and Climate Change NSW. It is designed to help organisations understand sustainability, successfully manage for a better environment and add business value⁷⁹. Industry Investment NSW offers “LEAN and green” business master classes for people who want to learn how they can improve business efficiency through the application of “lean” business practices, coupled with environmental sustainability, to reduce costs, increase profits, open new markets and create jobs⁸⁰. Despite initiatives like these, it is not always easy for SMEs to take up training opportunities in skills for sustainability. This makes it difficult to upgrade the skills of the existing workforce in sectors dominated by SMEs.

Opportunities

Strengthening connections between VET providers and industry

There are considerable benefits to be gained from strengthening connections between vocational education and training (VET) providers and industry. These connections can be informal (for example, consultations at a breakfast hosted by a TAFE Institute or an economic development agency) or formal (for example, to make progress on a project in which the partners have identified genuine business opportunities). Rather than arranging general partnerships, it can be more engaging to establish innovation networks around specific issues, since it is easier for partners in such networks to identify and capture benefits for themselves from their participation. In order to keep the focus on meeting genuine market opportunities, it can be beneficial if a network is industry-led rather than led by a training provider.

Connections of this type have been made in Sydney. The creation of the Green Skills Hub at the Nirimba campus of the Western Sydney Institute, for example, involved a close partnership with Schneider Electric that continues with the facility being made available to Schneider Electric for the training and education of customers, business partners and staff in the use of its EcoStruxure solution. The Northern Sydney Institute has formed partnerships with Local Councils – Rockdale, Fairfield, Lane Cove, Hunters Hill – based on the initial programme customised for 1 000 Warringah Council staff in the National Unit of Competence. They participate in environmentally sustainable work practices. The Sydney Institute has created a Sydney Green Skills Alliance to develop partnerships that will help forge a new collaborative approach to meet the challenges of Australia’s new green economy. Partnerships such as these should not focus exclusively on the institutional level; individual trainers also benefit from close contact with industry and experts in emerging technologies. It is a mechanism, for example, to keep trainers up to speed with the skill demands of employers in their locality.

Scaling up innovation successes to higher levels

This report has described many examples of innovative successes within individual TAFE NSW Institutes that improve sustainability skills training to meet industry needs. To take full advantage of such successes, there need to be mechanisms for scaling them up to the state level. At a minimum, this includes a carefully designed communications strategy for identifying successes and bringing them to the attention of influential stakeholders. This has been assisted in recent years by organising awards to recognise innovative or best practice initiatives. A further step is to ensure that the State’s research community (including academics in university departments) has appropriate institutional incentives to engage in applied research, such as identifying strengths in the VET sector. Similarly, there can be opportunities to leverage strengths developed at the regional level into leadership at a national or international level. This opportunity is explored further in the recommendations section.

Improving careers information, advice and guidance

Much of the discussion in this chapter has focused on improving the capabilities of training providers and of industry. Nevertheless, there are important issues around how information is provided to people who are making choices about their own individual training. These choices represent substantial investments of time and money in gaining human capital; consequently there are potentially large benefits to be gained from ensuring decision-makers have access to good information about industry demand for skills, including skills for the green economy. In the modern era of life-long learning and career management in the face of technological advances and industry restructuring, all citizens should have access to high quality careers information, advice and guidance. Nevertheless, it is particularly important that young people are not shut out of opportunities in the green economy as a result of receiving guidance from counsellors who have not kept up to date with developments in local and national labour markets.

Threats

“Lock in” to the wrong skills training and industrial development trajectory

In a regional skill ecosystem, industries are continuously investing in emerging technologies, training providers are continuously investing in specialist facilities, and workers and new entrants are continuously investing in skills training. In all cases, there are risks involved, since the decision-maker may discover in the future that an unpredictable change in market conditions or the policy environment has resulted in the original investment becoming obsolete. In the past, some government policies at the federal and state levels (such as industrial policy based on ‘picking winners’ for public subsidies) have been rightly criticised for locking individuals or businesses into a narrow skills training or industry development trajectory that has proved unsustainable.

Uncertainties around government environmental policies

It is difficult for businesses to identify genuine business opportunities with confidence when there is uncertainty about government environmental policies. In some cases this has led to high business resistance to anything with ‘a green label’, regarded at best as a distraction from more pressing commercial issues (such as improving basic skills in literacy and numeracy or raising enrolments in science, technology, engineering and mathematics courses). In these cases, there is little interest in learning about ‘green skills’ qualifications or employing people with these qualifications. This in turn can feed through into low demand for the qualifications from trainees.

Skills gaps can create disasters

This chapter began by noting the universal concern that skills gaps can constrain business opportunities. In some cases, a skills gap can create a disaster. A recent example was the Government’s Home Insulation Program, which was suspended on 19 February 2010 after reports that there have been four deaths of young Australians and over 100 house fires linked to the installation of insulation⁸¹. This was an apparent example where a potentially valuable government programme failed, with disastrous consequences, at least in part because workers did not have the right skills training.

Recommendations for Sydney

The SWOT analysis in this chapter shows that Sydney has considerable strengths in skills training for sustainability. These strengths have been further developed by recent federal and state investments in the Australian National Skills Framework and in individual TAFE Institutes to upgrade the country’s VET system’s ability to deliver skills for the green economy. It is also clear that the weaknesses identified in this chapter have been well recognised in Australian policy research reports, with evidence that policy makers are addressing these areas of weakness as resources permit. Consequently, this section will concentrate on four recommendations that aim to develop opportunities and reduce threats for enterprises that are leading the development of the green economy in Sydney.

Assess training needs based on analyses of authentic market opportunities

Figure 13 recognised that a skill ecosystem must be led by market opportunities. At detailed level, it is individual enterprises that identify and respond to such opportunities, but this can be assisted by the provision of authoritative information by independent third parties. This consideration is true not only for businesses but also for school leavers and current employees making decisions about whether to invest in skills training for sustainability. The current situation is also affected by a high degree of uncertainty around key policy parameters such as the price of carbon emissions and the details of programmes aimed at reducing global climate change.

Against this background, some countries and some regions have found it valuable to commission authoritative training needs assessments based on analyses of authentic market opportunities. Examples include the country-level research in Ireland (Forfás, 2010) and the California Workforce Education and Training Needs Assessment (discussed in more detail as a learning model in the Annex). To be authoritative, the study must be carried out by a team of people who are recognised as expert and independent; this is typically achieved by engaging university researchers with a national or international reputation in labour market analysis. The identification of authentic market opportunities is often informed by official strategies for reducing greenhouse gas emissions and achieving other social, economic and environmental goals.

Sydney is well placed for such research. The City of Sydney, for example, is committed to reducing greenhouse gas emissions by 70 % over twenty years, supported by well-formulated strategies to reach that goal. Sydney contains world-class research universities and has a very highly developed system of VET provision. It would be valuable if the release of policies of this nature was followed shortly afterwards with an authoritative training needs assessment arising from each policy. Over time, this would build up expertise in preparing such assessments and would foster confidence in local businesses and the local labour force to invest in relevant technologies and training that will help the green economy to grow.

Strengthen the ability of local businesses and local training providers to develop innovative solutions for filling gaps in skills for sustainability

This chapter has identified examples of how local businesses and local training providers are developing innovative solutions for filling gaps in skills for sustainability. These include the Sydney Green Skills Alliance at the Sydney Institute, the partnership between the Western Sydney Institute and Schneider Electric, and the partnership described in Box 6 between Bunnings Warehouse and the Northern Sydney Institute. Examples such as these illustrate the way in which a high-skills ecosystem can coordinate technological investment by enterprises with training investment by workers to enhance a regional or a sector's economic development.

Current policy developments in the United Kingdom suggest that the ability of local businesses and local training providers to develop innovative solutions for filling gaps in skills for sustainability could be strengthened. The United Kingdom government is setting up local enterprise partnerships in England with mandates, among other things, to engage directly with networks of colleges and training organisations in order to advance local strategic priorities. This is a very recent policy announcement, so details are still emerging as this report is being written (see further details in the learning model presented in the Annex).

RDA Sydney shares many of the characteristics and roles envisaged for the English local enterprise partnerships. It also has experience in working with industry leaders and local TAFE Institutes to develop skills training for important clusters in Western Sydney. This recommendation would substantially increase its work in this field for the whole of Sydney. RDA Sydney would also be a suitable organisation for ensuring that training programmes are available that cater to the specific requirements of small to medium-sized enterprises. This recommendation would be assisted by greater flexibility for TAFE institutes to create new courses in response to clearly identified market opportunities for local industry (in advance of a new competency being formally recognised in the National Skills Framework).

Seek to leverage the work already underway under the Sustainable Sydney 2030 vision to achieve international leadership in a particular technology or groups of technologies

The *Sustainable Sydney 2030* vision is for a green, global and connected city. The strategy describes Sydney and Australia's most significant global city and international gateway. It aims for Sydney to be recognised as an environmental leader with outstanding environmental performance and new 'green'

industries driving economic growth. The City of Sydney has initiated a process that will see 70 % of its energy needs produced locally from trigeneration plants.

Consistent with this vision, it may be possible to leverage the work already underway for Sydney firms to achieve international leadership in a particular technology or groups of technologies. Achieving such an ambition could potentially generate national and global business opportunities based on the ongoing development of world-class skills in the technology. A learning model presented in the appendix describes how a facility in Denmark is aiming to be Europe's number one centre for testing, demonstrations and research into technology harvesting renewable energy offshore (the Lindoe Offshore Renewables Centre).

The Lindoe Offshore Renewables Centre initiative is made possible by close collaboration among large enterprises, local government and university researchers. Following the Lindoe example, leadership for any similar initiative would need to come from the business community with the support of local and State governments.

Maintain a systematic approach to preparing young people for participation in the green economy

The NSW Department of Education & Training recognises the significance of sustainability education. Sustainable Schools NSW, for example, is a government-funded support programme to help schools integrate environmental learning and awareness into all aspects of their activities, supported by a wide range of web-based resources at www.sustainableschools.nsw.edu.au. This support reflects the principle that the education system should aim to ensure that school leavers are well equipped for emerging opportunities in the green economy.

Consistent with this principle, all school leavers should have fundamental capabilities in literacy, numeracy and computing skills, since school leavers without these capabilities will find themselves locked out of many training and employment opportunities. Similarly, this chapter has quoted the view of the CEDEFOP/ILO (2010) and others, that foundational skills for science, technology, engineering and mathematics (STEM) provide the basis for high-level low-carbon skills. It is important that young people are aware that 'skills for sustainability' are not an alternative to these core skills but build on them to make the discovery and dissemination of new technologies possible.

Indeed, a key message in a wide range of reports on the green economy is that technological advances are occurring at a fast pace. Consequently, the professional development of counsellors and educators involved in career guidance and career education must ensure they are able to communicate to their clients about careers opportunities emerging in the green economy. This obviously includes careers counsellors in schools, but will also include subject teachers in schools and in tertiary institutions. The Education Employment Linkages learning model in the Annex suggests that members of the Careers Advisers Association of NSW are natural allies for disseminating knowledge to young people about emerging opportunities and requirements for participation in the green economy.

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