



Final Report

Adapting to Climate Change in North East Victoria: Analysis of Skills

8 MAY 2012

Prepared for
North East Greenhouse Alliance

This project is funded under the Australian Government's Water for the Future initiative through the Strengthening Basin Communities program.

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Date: **8 May 2012**
Reference: 43260578/1/2
Status: Final Report

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Introduction

1.1 Background

The North East Greenhouse Alliance (NEGHA) has engaged URS Pty Ltd to undertake the ‘Skills, Knowledge and Behaviour Change for Resilient Economies’ project. The project is focused on facilitating climate change adaptation in local industries within the North East region through assessment of required skills and knowledge and the delivery of practical tools and solutions to selected vulnerable industries. For simplicity, we refer to this as the Industry Pilot program throughout this document.

The NEGHA coordinates a range of greenhouse projects across the six local government authorities (LGAs) of Alpine, Towong and Indigo Shire Councils as well as City of Wodonga, Rural City of Wangaratta, Benalla Rural City and the North East Catchment Management Authority in north-eastern Victoria. Several other organisations are also partners and associate members of the alliance, including Latrobe and Charles Sturt Universities, North East Water, the Alpine Resorts of Buller / Mt Stirling, Mt Hotham and Falls Creek and the regional EPA office.

Industries in the six LGAs covered by this study are diverse; including agriculture, forestry, food processing, textile manufacturing, wood product manufacturing, tourism and education. Some of these industries are more ‘climate dependent’ and therefore vulnerable to climate variability and change than others. Marsden Jacobs (2012) found that Towong and Alpine shires are the most reliant on climate dependent industries; these being agriculture in the case of Towong Shire, and snow-based tourism in the Alpine Shire.

Under the Australian Government’s Strengthening Basin Communities program, the NEGHA received funding for its Adapting to a Low Water Future (ALWF) project, which included a report on ‘A skills gap and training needs analysis’ (Mitchell et al. 2011), which sets the scene for this project.

The Industry Pilot program is part of the Water in the North East – Socioeconomic Adaptation Planning (SEAP) project, funded under the second round of the Strengthening Basin Communities grants program. This larger project aims to understand the vulnerabilities in these communities and build their resilience to climate change. The SEAP project has three phases:

- Phase 1 – vulnerability assessment and resilience planning
- Phase 2 – socio-economic planning, development and change program studies
- Phase 3 – region climate change adaptation strategy

A Socioeconomic Resilience Plan (Arold & Kinrade, 2012) was the major output of Phase 1, which identifies vulnerable groups within industry and community and potential mechanisms to improve their resilience to climate change. The Industry Pilot program is part of Phase 2 of the SEAP project. Other Phase 2 projects focus on community engagement and consolidation of existing strategies and recommendations.

1.2 Objectives

The focus of this consultancy is to pilot the delivery of two mechanisms that can improve industry access to relevant climate change knowledge. The objectives of the consultancy are to:

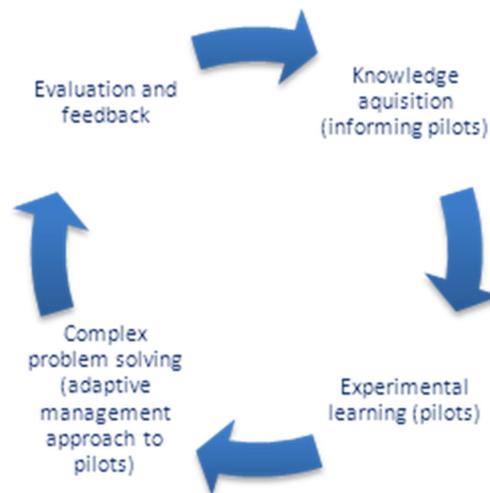
- To identify and analyse skills and knowledge needed to build resilient and adaptive economies and identify gaps in capacity building programs
- To build economic resilience within the region targeting vulnerable sectors of the economy

1 Introduction

- Develop awareness, capacity and resilience to climate change and resulting water related issues within targeted industries in the region and
- Provide a pathway for industries in the region to undertake action to enable adaptation to climate change impacts.

The following 'Action Learning' approach has been adopted in response to these objectives:

- Knowledge Acquisition (informing pilots) – Review of programs to inform pilots, reviewing all previous program information and consultation with SEAP Project Steering Group
- Experimental Learning (delivering pilots) – Learning by delivering two pilots to industry
- Complex Problem Solving (adaptive management approach to pilots) – Responding to issues, positive responses, un-intended benefits/weaknesses etc as they arise and
- Evaluation and Feedback – Reflection by project team, SEAP Project Group and NEGHA Project Manager based on experiences and feedback from the pilots.



Action Learning Approach

Acquiring prior knowledge through a review of previous work will help identify potential gaps in capacity building programs relevant to industries and businesses vulnerable to climate change impacts in North East Victoria. This report presents this analysis of skills, which will inform potential pilots as well as identify other opportunities to assist industry in building resistance to climate change and variability beyond this consultancy.

1.3 Report structure

The remainder of the report is structure as follows:

- **Section 2** assesses current skills and knowledge needs as well as potential gaps in capacity building programs by drawing on previous work for NEGHA by Mitchell *et al* (2011) and Arold & Kinrade (2012).
- **Section 3** provides a rapid review of behaviour change mechanisms in relation to climate change adaptation and resilience for the tourism, forestry, manufacturing and agriculture industries. The review highlights the most promising features as well as barriers and opportunities for candidate industry pilots.

Skills and Knowledge needs

2.1 Introduction

This section assesses the current skills and knowledge needs by drawing on previous work completed for NEGHA by Mitchell *et al* (2011) and Arold and Kinrade (2012). The recommendations made by these studies are then considered in terms of Les Robinson's *5 Steps to enabling change*, which will direct the selection of the pilots to be delivered. Of the recommendations made by previous reports, we lastly suggest which would have the most potential for this Industry Pilot project.

2.2 Skills gap and training needs analysis

NEGHA has previously undertaken a skills gap and training needs analysis for NEGHA partners within North East Victoria (Mitchell *et al* 2011). This work provided NEGHA partners with strategies and recommendations in terms of skills, knowledge, capacity and training requirements needed to meet the effects of climate change on water resources.

The project identified a number of external and internal factors that may affect these requirements for NEGHA partners including:

- Climate change
- Water shortages
- Extreme weather events
- Projected future shortages of skills and capabilities within the water sector
- Changing legislative and policy environments and continuous improvement
- Workforce planning issues and
- Recruitment and retentions issues (Mitchell *et al* 2011).

Of particular concern to NEGHA partners were the recruitment and retention of people with specialised skills to regional areas (Mitchell *et al* 2011).

Major challenges and trends identified in the study that affected skills and training needs included workforce decline, emerging skills gaps, fragmentation of training gaps and the impending retirement of a large section of the workforce (Mitchell *et al* 2011).

As part of the study an extensive training scan was undertaken, which revealed that North East Victoria is serviced well by the education sector and offers a range of flexible delivery modes from small vocationally specific training to postgraduate research degrees (Mitchell *et al* 2011).

It was generally acknowledged that NEGHA partners were managing their current knowledge, skills and trainings needs adequately with respect to the impact of climate change on water resources (Mitchell *et al* 2011). Mitchell *et al* (2011) referred to previous research undertaken by URS for NEGHA which engaged focus groups to test key stakeholders' (e.g. tourism, business, agriculture and communities) understanding of climate change in North East Victoria (URS, 2007). This study showed that stakeholders generally agreed that the skills required to successfully adapt to climate change currently exist.

However, Mitchel *et al* (2011) did identify a need for improved skills in the areas of natural resource management and sustainability as well as the following current and emerging skills and knowledge gaps:

- Technical skills
- Broad multi-disciplinary awareness
- Keeping abreast of developments in science and technology and

2 Skills and Knowledge needs

- Water sensitive urban design Mitchel *et al* (2011).

Through a desktop assessment, it was noted that a bachelor degree in natural resource management and/or environmental science provided by a local tertiary institution would largely address these skills and knowledge gaps (Mitchell *et al* 2011).

Research was also completed on climate change adaptation training options and gaps. The research focused on courses related to water, environmental science/management, sustainability, conservation and land management. The authors found there were no on-campus environmental engineering courses offered in the North East (Mitchel *et al* 2011). However, the main TAFE providers in North East Victoria did offer courses relevant to those working in the natural resources, water planning and sustainability areas, including; Catchment and Land Management and Diploma of Sustainability (Mitchell *et al* 2011).

Mitchell *et al* (2011) made the following recommended in order to address current and emerging skills gaps:

- **Need for broad skills** –in natural resource or environmental management and/or sustainability throughout NEGHA partner organisations, but particularly at higher levels
- **Development of appropriate training and education opportunities** – NEGHA partner organisations to work more closely with the tertiary sector to address the reported lack of development in appropriate training and education opportunities and
- **Sharing of knowledge and skills** – Undertake regular interaction within Departments and between NEGHA partners to ensure sharing of knowledge and skills.

The study suggested a mechanism referred to as the ‘Water Skills Training Centre’ to coordinate and/or deliver training for skills in strategic water resource planning and management (Mitchell *et al* 2011).

In lieu of this, it was recommended that a training co-ordinator role for water-planning and management in North East Victoria be created (Mitchell *et al* 2011). This role would identify, coordinate and deliver relevant training and knowledge sharing activities and programs, identify and assess the relevance of emerging technological trends to the region and source relevant funding (Mitchell *et al* 2011).

These strategies are important for in the design and delivery of well informed, practical and enabling capacity building and engagement programs to improve the climate change resilience of industry in North East Victoria. However, these mechanisms are not industry-specific, and as such are not considered potential pilots for this consultancy.

2.3 Climate Change in North East Victoria: Vulnerability Assessment and Resilience Plan

NEGHA has developed a *Climate Change in North East Victoria: Vulnerability Assessment and Resilience Plan* (Arold and Kinrade 2012), which provides an assessment of industries and communities in North East Victoria that are vulnerable to climate change and variability.

While Arold and Kinrade write that ‘the economy and community of North East Victoria appears to be quite well place to deal with the potential impacts of climate change and vulnerability’, the following observations are also made by the *Plan*:

2 Skills and Knowledge needs

- There is a strong level of understanding about the climate change issue and the implications of climate change and variability for businesses based on dealing with climate extremes in the past
- There is a need for more specific and practical support to help businesses plan for, respond to and recover from climate extremes (particularly smaller businesses in the agricultural and tourism)
- There is a need to focus on:
 - The agricultural sector across the region, but especially in Towong
 - The tourism sector, especially in Alpine Shire and
 - Food processing & beverages, pulp & paper, wood products and textile manufacturing industries, especially in Wangaratta and Indigo Shire.

The *Plan* (Arold and Kinrade 2012) provides a review of existing programs and activities already in place that aim to build and strengthen economic and community resilience in North East Victoria. It identifies numerous other programs and activities that also assist industries and individual businesses during times of change or hardship, such as extreme weather events, and strengthen their capacity to adapt to those hardships. Examples include:

- Rural financial counselling services that improve financial self-reliance and business planning
- Water and energy efficiency and/or greenhouse gas emissions reduction programs
- Information and education on business continuity planning and
- Informal networks and groups, facilitating knowledge transfer (Arold and Kinrade 2012).

Through resilience planning workshops, follow-up consultation, and more detailed consideration of established programs, vulnerable groups, previous consultations and actions initiated or proposed elsewhere, a number of actions were proposed (Arold and Kinrade 2012). These are provided in Table 1. Highlighted actions are those deemed suitable for implementation in the short term, and may therefore have potential as pilots for this project. Further brief description of these highlighted actions are provided and evaluated for their suitability as pilots according to key criteria as described in Section 2.5 (Table 2).

Table 1 Actions identified for vulnerable industries in Climate Change in North East Victoria: Vulnerability Assessment and Resilience Plan

Agriculture and forestry	Manufacturing	Tourism
Promote and improve outreach of established farm management and planning service	Sustainability opportunities information and support package	Tourism business forward planning and crisis preparation
Training programs to encourage farm succession planning and good practice	Region wide audit of industries exposed to climate change	Business continuity training program and toolkit
Research and trials into adaptive farm management practices	Business continuity training program and toolkit-manufacturing	Visitor extreme weather communications and travel plan
Land bank	Industry sustainability network	Prescribed burn research, communications and 'non-burn' periods
Sustainable land use strategy		
Long range regional weather forecast information*		

*Note: Believe this may already be available on Elders web site (www.eldersweather.com.au)

2 Skills and Knowledge needs

2.4 Proposed mechanisms fit with Industry Pilot program

The compatibility of previously identified mechanisms with Les Robinson's *5 Steps to Enabling Change* has been assessed in order to determine their suitability as pilots for this consultancy (Table 2). Mechanisms were rated on a scale of 1-5 depending on the number of steps, or conditions, met by each. These *5 Steps* are described in the box below.

Les Robinson's 5 Steps to Enabling Change (Source Les Robinson www.enablingchange.com.au)

Les Robinson's *5 Steps to Enabling Change* is a checklist of five conditions to consider when designing a change management program. The principle is:

"for sustained adoption of a behaviour or product, all five the conditions need to be present in the actors' lives"

The five conditions are:

1. **Desirability** – ensuring the behaviour answers frustrated wants of the actors (i.e. for more autonomy, time, respect, security, health and predictability)
2. **Enabling context** – changing the environmental factors to exert an influence on behaviour (i.e. modify the social, technical, physical and institutional context to enable action)
3. **Can do** – increasing the actor's self-efficacy by lowering the perceived risks of action (i.e. people must have confidence that can manage the social, physical and financial risks of change).
4. **Positive buzz** – having a story that prepares people to act (i.e. generate positive buzz so interest and enablement spread along social networks)
5. **Invitation** – inviter needs to be passionate, similar, connected, respected and powerful (i.e. frame an emotionally compelling invitation from a credible inviter)

Additionally, Table 2 assesses how well previously identified mechanisms relevant to industry fit with the principles established in the initial project funding submission, which are as follows:

- Ensuring empowerment and engagement – Affected populations and economies need to be actively involved in the development of adaptation and resilience building actions to ensure empowerment and ownership and adoption of solutions (engagement)
- Social inclusivity and equity – The process used and solutions developed need to be socially inclusive and equitable and
- Flexibility and adaptability – The process and framework need to consider flexibility and uncertainty with regards to assumptions made and development of solutions.

The funding principles score (1-3) is based on the number of the above principles met by each mechanism. The combined score is the total of both scoring categories.

Based on the analysis outlined in Table 2, the two toolkits which have the greatest potential for this project are those for tourism and manufacturing businesses. However, as described in Section 3, there is already a large proportion of readily available relevant information for these industries. The toolkit mechanisms could potentially be further strengthened by reflecting on businesses' need for specific 'tailored' and practical support and how this can best be delivered to encourage its adoption.

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Table 2 Mechanisms identified for vulnerable industries in Climate Change in North East Victoria: Vulnerability Assessment and Resilience Plan against criteria

Mechanisms identified in previous work relevant to industry	Brief description	Les Robinsons 5 Steps (1-5)	Funding principles (1-3)	Combined score (2-8)
Sustainability opportunities information and support package	Develop an information and support package on water, energy, waste and cost savings. The package would target manufacturing firms in the region, providing firms with information and support on (1) available technologies, systems and processes for reducing water and energy consumption and waste, with case studies (2) audits and other support to identify water, energy and waste reduction opportunities (3) sustainability training programs available and (4) relevant available government assistance and grants programs.	3	3	6
Business continuity training program and toolkit	As per the Sustainability opportunities information and support package for manufacturing above the program would be extended to include tourism businesses.	3	3	6
Region wide audit of industries exposed to climate change	A high level audit of manufacturing industries in the North East region to assess which industries have the greatest level of exposure to climate change, variability and response in terms of energy and water consumption, other resource inputs and markets. The audit would consider the impacts of reduced water availability, increased rainfall variability and climate extremes and carbon pricing on: (1) costs and availability of water and energy (2) the supply chain to manufacturers dependent on agricultural and forestry inputs and (3) other indirect impacts, such as disruptions to transport.	2	1	3
Industry sustainability network	Develop a regional network of industries implementing or interested in implementing sustainability practices (e.g. water, waste and energy reduction initiatives).	2	2	4

2 Skills and Knowledge needs

2.5 Conclusions

This section has identified the following skill gaps and training needs based on previous work.

Current and emerging skill gaps identified within NEGHA partner organisations included:

- Technical knowledge and skills
- Broad multi-disciplinary knowledge and as skills
- Environmental/sustainability/natural resource management knowledge and skills
- Keeping abreast of developments in science and technology and
- Water sensitive urban design.

Previous studies suggest appropriate training and education opportunities need to be developed and knowledge sharing between government organisations could be improved. It was noted that a bachelor degree in natural resource management and/or environmental science provided by a local tertiary institution would also largely address the skills and knowledge gaps identified.

Additionally, the creation of a 'Water Skills Training Centre' or a training co-ordinator role to coordinate and/or deliver training in strategic water resource planning and management in North East Victoria were recommended. These strategies are important for NEGHA partners to be able to design and deliver well informed, practical and enabling capacity building and engagement programs to support industry resilience to climate change in North East Victoria.

Industry has a strong level of understanding of the implications of climate change and variability for businesses based on experiences with extreme climate events. A need for specific and practical knowledge and skills that helps industry plan for, respond to and recover from climate extremes (particularly smaller businesses in the agricultural, tourism and manufacturing industries) was identified as a key gap.

The delivery of toolkits for tourism and manufacturing businesses aimed at a delivering a range of practical information in relation to sustainability are considered to have the greatest potential of those recommended as pilots for this consultancy.

Rapid review of best practice behaviour change programs

3.1 Introduction

In this section a rapid review of behaviour change mechanisms (international, national, state and local) in relation to climate change adaptation and resilience for the tourism, forestry, manufacturing and agriculture industries is presented. The strengths and weaknesses of each program, as well as barriers, constraints and opportunities for application as pilots in this project have been identified. Based on this analysis, features for the candidate pilots are identified and two candidate pilots are proposed.

3.2 Rapid review of best practice behaviour change programs

3.2.1 Approach

Mechanisms for behaviour change in relation to climate change adaptation and resilience for the tourism, forestry, manufacturing and agriculture industries were collated and reviewed based upon the following criteria:

- Fit with key vulnerable industries within the North East
- Potential to meet Les Robinson's 5 Steps to Enabling Change (Figure 2)
- Intended use and fit with project and the principles established in the initial project funding submission (i.e. ensuring empowerment and engagement, social inclusivity and equity, flexibility and adaptability) and
- Potential to fill a perceived gap/need as identified in Section 2 of this report.

Each program's strengths and weaknesses as well as barriers, constraints and opportunities for application as pilots in this project were identified.

Information on each behaviour change mechanism identified was therefore collated based on:

- Organisation
- Program/mechanism description
- Criteria described above
- Legacy
- Pros/opportunities
- Constrains/barriers and
- Source.

3.2.2 Findings

Forty-three mechanisms were identified through a rapid desktop review. Many of the mechanisms identified have had a web-based/information product and tools element to them. The uptake of these mechanisms is thought to be limited unless supported by specific extension/face to face activities.

The majority of mechanisms identified most closely aligned with the agriculture industry. There were a good range of mechanisms also identified for the tourism industry and also some generic programs that encompass all industries. There were fewer mechanisms specifically tailored to the forestry and manufacturing industries. However, this is a snap-shot assessment not a comprehensive review of all programs. Consequently, more effort could identify other relevant programs that were not identified in this study.

3 Rapid review of best practice behaviour change programs

Those mechanisms considered to have the greatest potential for this project were those which include tailored, practical advice, which is free and impartial and could be delivered through a variety of face-to-face mechanisms such as meetings, field days, workshops and information nights. These types of mechanisms have the potential to deliver a long-term legacy. Those mechanisms supported by additional, easily accessible information or information about how to link with other programs are also thought to be valuable. However, the success of these mechanisms is very much dependent on the readiness, need and interest of the industry/individual at the time.

Full results of the analysis are provided in Appendix A and also provided to NEGHA in an electronic format that can be used as a searchable tool.

The outputs of this review builds on a prior recommendation to provide a business continuity training program and toolkit (Table 2). Pilots delivered as part of this consultancy will be a tailored package of relevant program details to provide industries to improve the accessibility of this information.

Based on this analysis we have identified the most promising features for the candidate pilots:

- Face-to-face
- Practical advice
- Tailored for specific business/industry
- Free and impartial and
- Include access to other programs and supporting information.

Based on this review, consultation with the Project Steering Group and relevant council officers, URS has proposed the following two industry pilots:

- Green Suggestion Box and Advisory Service – The first of these pilots is a Green Suggestion Box and Advisory Service for manufacturing businesses in the Rural City of Benalla. This pilot aims to assist businesses to introduce a program (i.e. Green Suggestion Box) that encourages and rewards their employees to identify environmental (e.g. energy, water and material) savings. Tailored practical energy and water savings advice will also be offered to participating businesses.
- Speed Date a Sustainable Advisor – The second industry pilot is a ‘Speed Date a Sustainable Advisor’ event for accommodation operators located within Bright and Harrierville in the Alpine Shire. This event will link business owners with sustainable advisors who can provide advice to them on how to improve the sustainability of their businesses.

These pilots will be a valuable action learning experience, which will increase NEGHA’s knowledge and understanding about how successful these two mechanisms are likely to be at improving local industry resilience to climate change.

3.3 Conclusions

A rapid desktop review identified forty-three behaviour change mechanisms relevant to climate change adaptation and resilience for the tourism, forestry, manufacturing and agriculture industries. The suitability of each program for application as a pilot in this project has been identified.

Based on this analysis, the likelihood of success of the candidate pilots depends on the provision of practical, tailored, face-to-face advice that is free and impartial and provides access to other programs and supporting information.

3 Rapid review of best practice behaviour change programs

These attributes as well as Les Robinson's 5 Steps to Enabling Change will be considered as part of planning and delivering the pilots.

The pilots developed by URS are well placed to deliver practical, tangible tools to assist industry in North East Victoria build resilience to the challenges of climate change and variability. This is reinforced by meetings held with officers from participating LGAs, who are supportive of the respective pilots and are providing valuable assistance in the further development of each.

References

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Appendix A Analysis results

Appendix A - Analysis results

Organisation	Program	Mechanism	Industry fit?	Rating steps (1-5)	Fit / intended use (1-5)	Legacy	Pros / Opportunities	Cons / Barriers	Source
Sustainability Victoria	ResourceSmart	Online tools and information to help businesses reduce their environmental impact	All	2	2	Short - long term	Provides a range of information from which businesses can select depending on their needs	Online interface is not easy to navigate - not obvious how the program works	http://www.resourcesmart.vic.gov.au/for_businesses.html
Sustainability Victoria	Energy and greenhouse management toolkit	Seven online modules, Energy Smart Tracker and Green Business Guide	All	2	2	Short - long term	Modules provide comprehensive information and tools to help businesses reduce their carbon impact	Not industry specific, relies on businesses' self-motivation	http://www.sustainability.vic.gov.au/www/html/1938-energy-and-greenhouse-management-toolkit.asp?intSiteID=4
Carbon Down	Carbon Compass	Provides information on resources and actions SMEs can use to reduce their carbon impact	All SMEs	3	2	Short - long term	Provides a range of information from which businesses can select depending on their needs	Information is general in nature, i.e. not tailored to specific businesses	http://www.carboncompass.com.au/

Appendix A - Analysis results

Organisation	Program	Mechanism	Industry fit?	Rating steps (1-5)	Fit / intended use (1-5)	Legacy	Pros / Opportunities	Cons / Barriers	Source
VECCI	Sustainability consulting	Sustainability / energy / waste / carbon assessment	All	3	3	Short - long term	Provides tailored advice & recommendations	Minimal interface with business and therefore opportunity to engage, motivate; relies on businesses to implement recommendations	http://www.vecci.org.au/Consulting/business_sustainability_consulting.aspx
VECCI	Grow Me The Money	Grow Me the Money. 12 step, online program with information, education and advice for (small and medium sized) businesses on water and energy efficiency, and the reduction of their carbon footprint	All SMEs	3	3	Short - long term	Strong engagement factor with good online resources and support from consultants	Relies on businesses to be self-motivated to register	http://www.growmethemoney.com.au/
VECCI	Business Sustainability Training	Workshops and briefings on: <ul style="list-style-type: none"> • Creative Thinking and Sustainability • Marketing Your Environmental Business Credentials • Resource Efficiency and Your Business • Carbon Management 101 • Green Office Briefing 	All	2	3	Short - long term	Training can be tailored to specific businesses	No ongoing support, guidance, etc.	http://www.vecci.org.au/Training/Pages/business_sustainability_training.aspx

Appendix A - Analysis results

Organisation	Program	Mechanism	Industry fit?	Rating steps (1-5)	Fit / intended use (1-5)	Legacy	Pros / Opportunities	Cons / Barriers	Source
VECCI	Climate change fact sheets	Online fact sheets	Tourism, accommodation, cafes & restaurants, transport, retail and wholesale trade, business and professional services, manufacturing	1 to 2	3	Short - long term	Information is easily available and industry-specific	No ongoing support, guidance, etc.	http://www.vecci.org.au/IR_Advice/Business_Sustainability/Pages/Business_Sustainability.aspx
Alpine Resorts Coordinating Council	Keep Winter Cool	Awareness-raising initiative	Alpine tourism	3 to 4	3	Long term	Modelled on successful American campaign	Focuses on minimising the impact of alpine tourism on climate change i.e. solar lighting, not focussed on industry resilience building	http://www.keepwintercool.com.au/
AiG	Energy and sustainable business help desk	Help desk	All AiG members	3	3	Short - long term	Provides one-on-one tailored advice	May need more in-depth advice follow up.	

Appendix A - Analysis results

Organi-sation	Pro-gram	Mechanism	Industry fit?	Rating steps (1-5)	Fit / intended use (1-5)	Legacy	Pros / Opportunities	Cons / Barriers	Source
AiG	Carbon abatement across supply chains	Life cycle assessment case studies	Food manufactu ring	3	2	Short - long term	Provides information on the carbon intensity of different parts of the manufacturing process and how these might be improved	Highly specific to the products assessed - application to other products may be limited	http://www.aigroup.com.au/environment/supplychains/
Meat and Livestock Australia	Rainfall to pasture growth outlook tool	Online calculator of potential pasture growth based on rainfall, soil moisture and past pasture growth.	Agriculture	2	2	Short term	Enables landowners to better manage their business in times of climate variability	Not supported by information on how landowners might adapt their practices in light of climate variability	http://www.mla.com.au/Publications-tools-and-events/Tools-and-calculators/Rainfall-to-pasture-growth-outlook-tool
Meat and Livestock Australia	Feed demand calculator	Online calculator of the pattern of feed supply and demand	Agriculture	2	3	Short term	Enables landowners to better manage their business in times of climate variability	Not supported by information on how landowners might adapt their practices in light of climate variability	http://www.mla.com.au/Publications-tools-and-events/Tools-and-calculators/Feed-demand-calculator

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Organisation	Program	Mechanism	Industry fit?	Rating steps (1-5)	Fit / intended use (1-5)	Legacy	Pros / Opportunities	Cons / Barriers	Source
Meat and Livestock Australia	Fact sheets	Provide (often state-specific) information on climate change and climate drivers, water resources, commodities and adaptation	Agriculture	3	3	Short term	Provides landowners with detailed information on climate change impacts, adaptation measures and useful contacts.	Relies on landowner to act on information provided	http://www.mla.com.au/Publications-tools-and-events
AgriFood Skills Australia	Carbon proof Project	Online toolkit which enables businesses to achieve “quick win” cost-saving opportunities in the short term, and planning for carbon management and energy / water efficiency in the longer term	Small-medium food processors	3	3	Short - long term	Provides highly industry-specific information.	Relies on businesses to take up and act on information provided	http://www.agrifoodskills.net.au/current-projects/carbonproof-project/
Grains Research and Development Corporation	Climate Champion Program	Recruits farmers to help improve communication between scientists and farmers about managing climate risk	Agriculture	3	3	Short - long term	Enables two-way communication between farmers and scientists	Not clear how landowners are to engage with the program	http://www.managingclimate.gov.au/climate-champion-program/

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Organi-sation	Pro-gram	Mechanism	Industry fit?	Rating steps (1-5)	Fit / intended use (1-5)	Legacy	Pros / Opportunities	Cons / Barriers	Source
Grains Research and Development Corporation	Climate Kelpie	Aggregates available tools which assist farmers adapt to climate change	Agriculture	3	3	Short - long term	Provides a range of very practical tools, which can be searched according to region, commodity and topic.	Relies on businesses to take up and act on information provided	http://www.climatekelpie.com.au/
Cotton CRC	Responding to late season flooding	Scientists providing advice on management in response to flooding via site visits and newsletters.	Cotton	5	4	Short - long term	Provides responsive action and knowledge for issues now and in the future.	Reactive not proactive. Relies on research team being able to deliver knowledge in a timely and robust way across a large number of cotton growers.	http://www.cottoncrc.org.au/industry/CRC_home
Macquarie University and University of Melbourne	Encouraging climate change conversation	Film festival	All and community	4	2	Short	Provides an engaging/exciting forum.	Only short-term engagement/awareness - non targeted	http://alumni.news.unimelb.edu.au/encouraging-climate-change-conversation-through-film

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The University of Melbourne	Garden watering advice	iPod app watering advice in your pocket	Community	3 to 4	2	Short - long term	Provides an engaging/exciting forum.	Not focussed on industry. Only accessible to iPod owners/tech savvy with no adoption pathways.	http://alumni.news.unimelb.edu.au/watering-advice-your-pocket
Goulburn Murray Water	WaterMAP	Water management action plan to : (1) assess their water usage (2) identify inefficiencies and opportunities for water savings (3) prepare an action plan to implement water conservation activities (4) annually report on the implementation of water conservation activities.	All	3 to 4	3	Long term	Provides a method for determining water use and improving use.	Relies on self-audit process (thereby could limit adoption of new technologies etc.)	http://www.water.vic.gov.au/saving/industry/watermap
Mudgonga Community and Landcare	Pasture Recovery from Fire	Talk with question and answer session on pasture fire recovery	Agriculture (Grazing)	5	5	Short term response	Provides tailored and responsive response to hot topic/areas of need. Builds community.	Addresses mainly short-term needs.	http://mudgegonga.vic.au/

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Mudgego nga Communi ty	Information of bushfire assistance	Web site linked with town hall identifies various bushfire assistance information	Agriculture mainly	2	5	Short - long term	Provides information needed based on community need	No ongoing support.	http://mudgegonga.vic.au/
Burgoige e Creek Landcare Group	Managing pastures for climate change in the North East	Managing Pastures for Climate Change. Project coordinator (Tim Ekberg) that facilitates farm walks on a number of demonstration sites in the region which is supported by a blog with information on each demonstration site.	Agriculture	5	5	Short-long term	Engages and focusses community with hands on information sharing	Nothing to encourage critical thinking and application to own land.	http://managingpastures.posterous.com/pages/links-to-all-the-sites ; tim@farminganswers.com
Land care within the region	Pasture Update Series	Series of presentations on managing pastures and linking with key scientists from DPI	Agriculture	5	5	Short-long term	Engages community of new knowledge/science as it applies to their business	May not be specific to individuals needs and broader than climate adaptation	http://managingpastures.posterous.com/

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Goulburn, Murray, Hume Agcare (GMH Agcare)	Rural Financial Counselling Service	Free and impartial support and referral information to help clients to manage the challenges of industry change and adjustment, and improve financial self reliance and business planning advice on succession planning for farmers	Agriculture	5	5	Short-long term	Accessible and service orientated	May not include consideration of horizon risks such as climate change	http://www.gmhagcare.org.au/
North East Catchment Management Authority	Soil Carbon Program	Field days, workshops, information nights, newsletter etc.	Agriculture / Horticultural	5	5	Short-long term	Broad reach across all levels of farming from lifestyle to small intensive to large open grazing enterprises. Driven by the CMA rather than volunteer group i.e. administrative support in delivery of projects.	Reliant on ongoing Caring for our country funding or substitute funding	http://www.necma.vic.gov.au/OurPrograms/LandStewardship/SoilCarbonProgramme.asp

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RIST (rural industry skills training)	Vocational Training	Diplomas, certificates, apprentice training - classroom, experiential and online	Agriculture	4	3	Long term	Targeted courses e.g.: BeefCheque with integrated climate knowledge i.e. applied climate knowledge in pasture growing	Not specifically climate or carbon oriented training. Based in SW Vic = accessibility? Relevance for NE farmers?	http://www.rist.com.au/beefcheque
University of Melbourne	Greenhouse in Agriculture	Online portal to latest emissions research projects and outcomes of projects. Also portal for ALL industry based emission calculators.	Agriculture including beef, grains, sheep, dairy etc. Calculators include agriculture, horticulture and forestry industries across Australia	3	3	Short-long term	One-stop-shop for the latest emissions research and industry specific emission calculators designed for use by farmers across Australia. Updated regularly.	General public only find out about it via extension programs or specific reference.	http://www.greenhouse.unimelb.edu.au/ and http://www.greenhouse.unimelb.edu.au/Tools.htm

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DPI Climate	DPI Climate HUB	Online portal to DPI Victoria's climate, carbon and emission extension programs for farmers. Includes case studies, newsletters, animations, webinars, networks etc.	Agriculture , Horticulture and Forestry	3	3	Short-long term	Accessible material that is specifically developed and targeted to farmers to assist in increasing their understanding of climate carbon and emissions. Applicable state-wide, industry specific information.	Awareness of the site is dependent on promotion and specific reference.	http://www.dpi.vic.gov.au/climate

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Organi- sation	Pro- gram	Mechanism	Industry fit?	Rating steps (1-5)	Fit / intended use (1-5)	Legacy	Pros / Opportunities	Cons / Barriers	Source
DPI Climate	Landholder presentation s	Workshops, facilitated discussions, presentations tailored to the specific audiences	Agriculture , Horticultur e and Forestry	4	3	Short-long term	Direct learning through discussion of issues, concerns, mechanisms to react to emerging carbon policies and markets regardless of industry. Empowerment of farmers to start taking action now rather than immobilisation through confusion & not knowing where to start.	Usually one-off events so no measure regarding impact or degree of change taking place on the ground.	DPI Policy manager. For the Climate work, the DPI Grains Team.

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Organi-sation	Pro-gram	Mechanism	Industry fit?	Rating steps (1-5)	Fit / intended use (1-5)	Legacy	Pros / Opportunities	Cons / Barriers	Source
DPI Climate	Climate Risk	Newsletters, extension material including case studies and the Climate Dogs	Agriculture , Horticultur e and Forestry	3	3	Short-long term	Industry specific climate risk newsletters (The Break, The Fast Break, Milking the Weather, Climate Ready Horticulture etc.); easy to understand extension materials; attitudes to climate survey	Degree of penetration and influence for changing management practices.	

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Climate Kelpie	Climate Champions Program	R&D role amongst farmers. Develop other cropping options/trials such as sweet potato industry (clean area without nematodes and other disease) as alternatives to grazing and dairy. Summer crop focus. Have lower evaporation rates than west. Underutilised potential of water in region in terms of production for cash. Trialling new crops, soil moisture monitoring, remote sensing. Trial and practically demonstrating.	Agriculture		3	Short-long term	Local identities, running their own farms advocating and demonstrating to their peers what can be done by doing it themselves and talking about how they did it & the outcome of doing it.	Relies on chosen 'champion' on having a good rapport in the community and able to tell and sell their story.	http://www.climatekelpie.com.au/ask-a-farmer/climate-champion-program ; Bruce Saxton from Towong area saxto@bigpond.com 0260769222 (Chairman of Upper Murray Business Group)

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Organisation	Program	Mechanism	Industry fit?	Rating steps (1-5)	Fit / intended use (1-5)	Legacy	Pros / Opportunities	Cons / Barriers	Source
Climate Kelpie	Climate Champions Program	Using local farmers to tell their story on how they are taking action to adapt to climate change, create opportunities in the emerging carbon & emissions markets and advocate best management practices in their regions. NE - Bruce Saxton	Agriculture	5	5	Short-long term	Local identities, running their own farms advocating and demonstrating to their peers what can be done by doing it themselves and talking about how they did it & the outcome of doing it.	Relies on chosen 'champion' on having a good rapport in the community and able to tell and sell their story.	http://www.climatekelpie.com.au/ask-a-farmer/climate-champion-program
Climate Kelpie	Manage Climate web portal	Online web portal that links to other programs/climate sites specific to agriculture	Agriculture /Horticulture	3	4	Short-long term	Variety of information regarding adapting to climate change, links to other sites and programs	Awareness of program is not high	http://www.climatekelpie.com.au/

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Landcare	Various - dependent on group. NECMA also have input delivering their programs including the soil carbon program via land care networks and groups.	Landholder meetings; Landcare Network Coordinator for NE, employee of NECMA.	Freehold land managers	5	4	Short-long term	Community based and run; grass roots, practical focus; various topics covered depending on interest.	Relies on volunteerism and being a long-running program many groups may be suffering from burn-out. May only appeal to certain 'farmer' demographics depending on the group	http://northeast.landcarevic.net.au/groups
GRDC	Groundcover; Climate program	Bimonthly magazine for growers and service providers; internet, farm walks and information days; support to farmer agribusiness forums e.g.: WCFA.	Grain Growers	4	3	Short-long term	Latest research and advances in climate adaptation are communicated in a timely manner. GRDC is a well respected organisation with a large, national, loyal following	Limited reach in NE Victoria because of land use and crop types.	GRDC supports Climate Kelpie programs (financially as well as promotion). http://www.grdc.com.au

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EPA Victoria	Carbon Offsetters Guide	Web site with carbon offset suppliers, retailers and brokers	Agriculture/Horticulture/Forestry	4	3	Short-long term	Complete listing of traders/retailers for all types of emission avoidance and sequestration project types	There are so many listed it's difficult to know where to start	http://www.carbonoffsetguide.com.au
PICCC	National research collaboration (linked directly into CFI activity & policy development) specific to climate carbon & emissions including research summaries, education opportunities and news & events	Website	Agriculture and forestry service providers predominantly	3	3	Short-long term	Highly relevant for service providers	Not for farmers/landholders	http://www.piccc.org.au/

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Future Farm Industries CRC	EverGraze; EverCrop; New Woody Crops; and Environment	Website, research sites, extension including field days	agriculture and forestry	4	3	Short-long term	Climate related information through improved production systems thereby establishing buy-in from their target audience	Specific programs specific to regions where there are extension officers on the ground (EverGraze is active in NE Vic)	http://www.futurefarmonline.com.au/
Accor hotel	Annual reporting of energy and water use per guest room.	Accor reports the kilowatt hours per day of energy consumption per guest room for each of its hotel brands as an easy to read graph. The annual report also shows average water consumption per guest room.	Tourism	2	2	Long term	Graph is easy to understand.	Only reported at the annual report level. Needs to be accessible for consumers.	http://www.ttf.org.au/Content/climatechangepaper.aspx
Tourism Cooperative Research Centre	Carbon calculator	On-line calculator to determine carbon emissions for holidays	Tourism	2	2	Long term	Easy to use, credible information base	Needs to be linked with outcome (no solutions or offsetting proposed)	http://crctourism.com.au/Page/Tools+and+Products/Carbon+Calculator.aspx

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Tourism Cooperative Research Centre	Risk Management Guide and tools	Information on how to develop a risk management strategy for a destination or a business and how to implement the strategy and to maintain its effectiveness over time.	Tourism	3	3	Long term	Comprehensive and simple approach covering key areas of risk	Labour intensive. Requires significant awareness of roles and responsibilities of emergency services, mustering points etc. in region to inform process.	http://crctourism.com.au/Page/Tools+and+Products/Tourism+Risk+Management+Guide+AICST.aspx
Department of Primary Industries	Rural Business Networking Event	Young People and Farming: attracting and keeping them workshop	Agriculture	3	2	Short-long term	Engaging and enables good networking strong speakers	Does not necessarily provide tangible solutions	Phil Haines Rutherglen Centre Leader (02 6030 4532)



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