

VCCCAR

think tank report

Regional business development in a
variable and changing Climate:
strategies for central Victoria





victorian centre for climate change adaptation research

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Executive summary

Overview

Central Victoria is home to a large number of diverse businesses which are ever changing. Growth in the manufacturing sector in the City of Greater Bendigo, for example, is projected at 800 new jobs over the next five years. Managing this growth is a key issue for local and regional governance. Doing this in a variable and changing climate is an additional challenge addressed by this think tank.

Central Victoria has a number of advantages and opportunities for ongoing business development. There is room to grow, adequate infrastructure, proximity to regional and metropolitan Victoria and excellent education and training facilities. The think tank showed that information about how climate change impacts on water availability and electricity supply is important for planning and operating regional businesses.

The purpose of the think tank was to facilitate a conversation between business leaders, government officials and academics in the region aimed at enhancing innovative ways to adapt and take advantage of future climate change with an emphasis on learning how different businesses are responding to operating in a variable and changing climate.

However it was clear during this think tank - which was advertised as focusing on adaptation strategies - that a number of participants were interested in mitigation issues related to energy consumption. This was especially so in the food processing and manufacturing businesses represented. Although we tried to make the distinction between mitigation and adaptation clear, the small group discussion summaries show the distinction was not clear, as they focused on the cost of energy and how to reduce their consumption.

Key findings by industry sector

The think tank identified common climate risks:

In relation to **food manufacturing**, these include a lack of water, drought, continuity of water supply and rain throughout the year, which could cause humidity-related problems. More likely extreme events include bushfire threat, due to the location of the factory.

In **small business** or retail (the most common type of business across central Victoria), climate impacts identified include increase in energy usage, decrease in water availability, increase in investment in cooling and heating assets, increase in demand for information around supply chains and carbon footprints, increase in insurance premiums, and changing social behaviours relating to how and where people shop.

The **dairy industry** is a major Victorian food exporter with farming and manufacturing across the state. In central Victoria this industry is reliant on irrigated pasture for its survival and climate impacts include; drought – hydrological (groundwater) & meteorological (rainfall), more extreme temperatures, feed availability, bushfire risk, flood risk, storms, increased energy costs, available feed, destocking, cover (protection from heat), increased water requirements for stock and pasture, increased pasture growth associated with increased CO₂.

Representatives from **Keech Castings** - a Bendigo foundry which is a high energy user participated in the think tank - identified climate impacts such as the cost of power (five per cent of net costs) and raw material (specialist sands) cost increases.

The climate impacts on **tourism** were seen as potentially severe. Extreme weather events (fire and flood) damage the thing people come to see and prevent them from visiting (e.g. bushfires in the Grampians). Many small tourism businesses often don't recover from such events. Preparing for the threat of the initial disaster and having a plan to deal with significantly reduced income in the months after is essential.

Adaptation issues across all businesses relate to coping with extreme temperatures, water restrictions, fire or flood. When climatic variations result in fire and flood

the impact is felt by all businesses. Adaptation through planning and preparation is seen as an essential strategy for the sustainability of all businesses during and beyond extreme climatic events.

Evaluation and future improvement

Seventy percent of those attending responded to an evaluation questionnaire. All felt that scope and relevance of the issues discussed was either good or excellent, with the industry case studies, stories and insights being most useful. Networking and participant involvement were also highly rated. Some felt that the presentation component was too long and that a wider variety of participants should have been invited/engaged. Eighty five percent of respondents agreed or strongly agreed that the think tank improved their understanding of climate change adaptation. Many attendees wanted to see the network developed at the think tank continue.

Policy recommendations

1. It was clear from the presentations and discussions that climate variability, climate change and climate related risks will impact on different types of industries in quite different ways. There is a wide variability in the types of climate events to which different businesses are susceptible. Potential changes in the frequency and intensity of these events are often not well described in general projections of future climate and changes in average conditions. One role of government in supporting adaptation is to inform industry and community about future risks. Messages about climate change adaptation planning should therefore recognise the diverse nature of interests of small to medium sized businesses in regional Victoria and the variety of potential climate hazards they may face.
2. Many business owners do not have a good understanding of their potential risks. Government needs to invest in improved climate risk assessment tools such as mapping of flood, wind, hail, heat, fire or other hazards and in improved warning systems for different types of hazards to allow businesses to respond effectively.

3. Larger businesses are generally well informed of climate risks and have sufficient internal capacity to respond effectively. Government policy should focus on programs and actions to support small to medium sized businesses in regional Victoria in both mitigating climate change (including increasing energy efficiency and reducing greenhouse gas emissions) and adapting to changing climate risks. The distinction between mitigation and adaptation needs to be made clear, although the best examples will be where firms are undertaking actions that meet both objectives.
4. Likely potential climate risks and opportunities and options for adapting to climate change in different types of businesses should be incorporated into business assistance, education and training programs.

Research needs

Further research is required to:

1. Better define and describe the different risks that are likely to affect different types of small and medium enterprises in different geographic locations in Victoria.
2. Review and analyse different adaptation options, including changes to physical infrastructure, financial risk management arrangements such as insurance, changes to business practice and behaviour (eg. changing the timing of activities during the day or the course of the year) and capacity to respond to warning systems.
3. Understand the beliefs and motivation of small to medium sized business owners in regional Victoria related to climate change adaptation and the barriers to successful adaptation.
4. Develop industry-specific examples of small to medium sized businesses in regional Victoria who have successfully incorporated climate change adaptation into their business.

Our approach to the think tank

In designing the think tank, **Regional business development in a variable and changing climate**, we took advantage of what we already knew about climate change adaptation. The likely future changes to our weather system in this part of the world have been outlined by the Bureau of Meteorology and our VCCCAR colleagues have done some valuable work in getting us to think about adaptation responses.

We took advantage of our networks in the greater central Victorian region and invited the Australian Industry Group, Bendigo Business Council, City of Greater Bendigo, Mount Alexander Shire Council and Central Victorian Solar Cities to help us design the program. While the focus was on adaptation, the observation that the larger the firm, the more strategic they are when it comes to preparing for external factors like adverse weather caused by changing climate, was true in designing and marketing the think tank as well as in the discussions on the day. In support of this observation, smaller local businesses were not well represented at this think tank. Our State government colleagues were proactive and engaged with regional business leaders on the day. One of the important aims of VCCCAR is to develop the understanding of government about effective climate change adaptation responses. It was clear that State and local government were keen to be a part of the day and participants made excellent contributions.

Presentations were made by the Bureau of Meteorology, Coliban Water, Murray-Goulburn Cooperative, Don-KRC, the Office of the Commissioner for Environmental Sustainability and Central Victorian Solar Cities. Dr Harvey Stern from BOM set the scene for three businesses to talk about their adaptation response. We then facilitated small group discussions using the four dimensions identified in the VCCCAR (RMIT) Adaptation Framework:

- Being prepared for hazards
- Managing risk
- Assessing vulnerability
- Building resilience

The groups reported back on discussions and provided summaries (see below). After the plenary discussion Lindsey Brown, from the Office of the Commissioner for Environmental Sustainability and Leah Sertori, Project Director, Central Victorian Solar Cities made presentations from their organisations relating to the think tank theme.



Key learnings

It was clear throughout the planning, execution and summaries of group discussions that not all businesses make a clear distinction between mitigation issues and adaptation to climate change. We believe this has much to do with the politicisation of the issue and the resulting media hype and confusion about the range of issues related to the way individuals, organisations and communities understand and respond to climate pollution and adapt to its consequences. VCCCAR has a vital role to play in this regard.

In conducting the think tank it became clear that the scope of a business might be a way of understanding the likelihood that a specific business would engage in a strategic conversation about the impact of climate change in both a mitigation and adaptation sense. We

have alluded to the challenges involved in getting small, 'high street' traders to participate in a one day think tank about adaptation strategies to climate change impacts, notwithstanding the efforts of the Bendigo Business Council, which advertised in its weekly electronic newsletters about this free event. On the other hand the larger corporate businesses typically with numerous sites and a global export orientation were able to tell a story that shows they are engaged in a strategic conversation about climate change in the broadest sense. This disposition of small business owners probably comes as no surprise to government officials interested in assisting all businesses to develop strategic responses to the carbon pollution issue and appropriate business responses. In order to help policy makers develop strategies to engage businesses in addressing climate change impacts we set out this relationship in Table 1 below.

Table 1: Contrasting the scope of a business and the likely engagement with climate change

	High	LEVEL OF ENGAGEMENT	WITH CLIMATE CHANGE	Low
Extensive, multisite, globally connected, listed corporation	SCOPE OF THE BUSINESS	Complex industrial manufacturing industry business with specific plans and strategies to address mitigation and adaptation issues.	Companies not yet considering the strategic implications of policies to address climate pollution and ways to mitigate and adapt.	
Specific locale, shop front in the high street providing unitary service typically as a family business		Small service businesses who recognise sustainability as a strategic advantage including mitigation and adaptation.	High street traders focussed on the bottom line with relatively short business time lines and no obvious interest in mitigation or adaptation.	

What is important for governments as part of an overall risk management strategy is to show these businesses how climate change will impact on them. In addition to the mitigation issues, and in particular the government's response via a carbon tax, leading to an emissions trading scheme, there are very real impacts such as heat waves, fire, storms and flooding, all climatic events which are predicted to occur more often in regional Victoria.

In the report on the think tank deliberations that follow, there are a range of ideas for policy makers and program managers to consider as they develop ways of encouraging regional businesses to prepare strategic climate change adaptation plans. The focus should clearly

be on motivating the business owners to engage. How will, for example, a prolonged heat wave impact a high street traders business? What would a flash flood do to their trade, their stock and their livelihood? Of course we are all too familiar with the impact of bushfires and most would concede that this is an important consideration in central Victoria.

The think tank proved valuable in bringing together businesses, government and university staff in a measured discussion of how businesses can best adapt to the impacts of climate change. We hope the ideas in this report will assist government and businesses plan for these impacts.

Think tank workshop summaries

Workshop brief

After listening to presentations from regional businesses, participants worked in small groups. They were asked to:

1. Choose a business/industry to discuss
2. Describe climate impacts on the business/industry
3. Identify the adaptation strategies (using the VCCCAR framework of hazards, risk management, vulnerability and resilience)
4. Make recommendations against each for: business owners, industry groups and all levels of government.

Think tank participants focused on the following business types in the region: smallgoods manufacturing (Don KRC), small business (retail), irrigated dairy farming, foundries (Keech Castings) and tourism.

Smallgoods manufacturing

Based on Don KRC in Castlemaine

Climate change impacts on the business/industry and adaptation strategies

Don KRC does not yet have a formal process to assess climate change impacts, although they do use a well-established and ongoing risk-management approach. So far they have carried out over 200 risk assessments onsite. Risk management is easy to quantify and fits in with all aspects of the business process: environmental, safety, finance, quality, operations and so on.

Much of the meat used by Don KRC comes from Canada – all cooked meat products are sourced overseas and all non-cooked products are from domestic sources (e.g. salami and ham on the bone). Australian breeding stock is limited (It is closed to the importation of breeding lines) due to biosecurity concerns. The quality and consistency of Canadian pork is better and the company can source parts of the animal, which cannot be done in Australia. Their aim is to double the amount of domestic meat used in their products.

Impacts of climate change on meat source

- Domestic – water and fire risk; piggeries' effluent treatment requires good farm management strategies, which might break down.
- Canada/US – the impacts of climate change are somewhat positive in the sense of warming that is extending the North American feed grain growing season, which previously had two cycles per season, but now has three; there is a trade off between the speed of shipping (slower uses less fuel) and the energy required to refrigerate the meat (too much energy required for refrigeration).

Risks of climate change to food manufacturing

- Lack of water, drought, continuity of water supply, but also increased rain over the whole year could cause problems related to humidity.
- Temperature (meat needs to be kept at eight degrees Celsius in the factory) for refrigeration and cooling towers; there is an impact on the processing if temperatures remain high a few days in a row.
- More likely extreme events such as bushfire – fire hazard due to factory location (although there is a buffer).
- Economic and financial risks of climate change include carbon tax, fuel excise etc. due especially to the transport of materials back and forth to Melbourne. It is not yet known how the carbon tax will affect the business (will the tax be on generators or consumers?); cogeneration will probably be an issue for Don KRC, as was consolidation of the three sites, which brought them above a threshold.
- Don KRC does not yet take a vulnerability approach to adaptation, apart from in their new buildings and co-generation plants, but there may be workforce vulnerability issues that are addressed by human resources (e.g. planning for extreme weather events).
- Some workforce issues that have been addressed since the takeover are increased salaries, better working conditions, stability, increased capital investment, and so on. The factory would not exist now if the takeover had not happened. Perhaps this is a way of increasing resilience in the community, given that Don KRC is the largest employer.

Recommendations

Business owners:

Benchmark energy and water use and learn what this means and how to compare performance. Identify and resource dedicated personnel within the company or source expertise from government programs, Commonwealth, state and local (e.g. Enterprise Connect sustainability software tool??). Create and maintain links with community and local government; engage with the community and partner with complementary groups (e.g. Don KRC and Mount Alexander Sustainability Group). Develop a strategic plan for adaptation.

Industry groups:

Facilitate cross communication of case studies and success stories.

Government:

Commonwealth

Recognise energy-efficient generation credits as part of the carbon tax. Ensure that the regulator requires distributors to explore energy reduction/efficiency policies before any upgrades to existing infrastructure (demonstrate how they have attempted to reduce consumption).

State

Take the lead to ensure that energy-efficient generation receives carbon credits (e.g. co-generation).

Local

Set emission reduction targets (e.g. City of Greater Bendigo), but ensure that baseline data is available and understandable.

Communicate with the community regarding the most cost-effective ways of reducing energy consumption (e.g. in community buildings, with complementary uses).

Small business/retail

Small business is the most common type of business across central Victoria covering services and retail. For this discussion we focussed on retail type businesses.

Climate impacts

- Increase in energy usage
- Decrease in water availability
- Increase in investment in cooling/heating assets
- Increase in demand for info around supply chain/ carbon footprint
- Increase in insurance premiums
- Change in social behaviours/norms (how and where people shop/live etc.)

Adaptation strategies

- Appropriate insurance
- Shut business (completely or temporarily)
- Move business to less vulnerable area
- Find temporary location (during extreme weather event)
- Diversify business e.g. online sales (So it can still operate during extreme weather event if physical premises are unavailable)

Recommendations

Business owners:

- Diversify funding streams
- Understand energy usage and look for efficiencies
- Develop plan for extreme weather event

Industry group:

- Develop training in planning for extreme weather events
- Hold forums to discuss issues facing small business

Government:

- Local Government - partner with Industry to develop training etc.
- State and Federal Government - develop best practice standards and provide funding for training

Irrigated dairy farming

The dairy industry is a major Victorian food exporter with farming and manufacturing across the State. In central Victoria this industry is reliant on irrigated pasture for its survival.

Climate impacts

- Two forms of drought – hydrological (groundwater) and meteorological (rainfall)
- More extreme temperature
- Feed availability
- Bushfire risk
- Risk of flood, storm events
- Increased energy costs, available feed, destocking
- Cover – protection from heat
- Increased water requirements for stock and pasture
- Increased pasture growth associated with increased co₂

Adaptation strategies

Hazards:

- Shelter
- Firebreaks
- Destocking
- Erosion prevention
- Fodder reserves, silage pits
- Strategic infrastructure planning for fire – e.g. hayshed location, (not beside milking shed)

Risk management:

- Water – stockpile entitlements, water, carry-over provisions, groundwater possibilities
- Planning and analysis of most significant risks
- Contracting out tasks, other contracting e.g. buying feed on (forward) contracts, leasing additional land nearby, share farming

Vulnerability approach:

- Water available - bore water, ground water options
- Recycling on-farm
- Market - exposure to just one industry - dairy farming and associated products
- Alternatives assured
- Alternatives to one industry - diversify
- Geographically diverse farms e.g. north and south Vic or NSW – hedge against adverse weather and water restrictions
- Relocation to less vulnerable areas - both farmers and manufacturers
- Labour force - loss of skills, available skilled labour, and impact on communities

Resilience:

- Risk spread - contracting, outsourcing
- Regional relocation
- Foster labour skills
- Diversification
- Innovation
- Forming co-operatives - diversify the co-ops e.g. sell milk products and also integrate e.g. use co-op strength to purchase grain and water for farmer members

Recommendations

Business owners:

- Diversification
- Risk management plan - critically assess, implement
- Prioritise - most vulnerable, least expensive - risk matrix
- Most importantly - make time to increase knowledge base (i.e. not just get staff trained, get business owners trained and importance of info recognised).

Industry groups:

- Education of concepts
- Needs to be proactive
- Leading role - give examples and support
- Cross pollinate across industries
- Networking and free - rather than VECCI membership costs and service costs
- Field officers - on site, relevant, credible
- Interactive workshops - encourage attendance
- Facilitate connections - knowledge sharing e.g. with government departments and others

Government:

Federal

- Make policies understandable
- Getting messages to farmers - go to the people
- Clarify where to go for information
- Not rely on website - engage with individuals face-to-face
- 70 per cent of dairy is exported - is 'free trade' relevant? Do farmers and industry want it? (carbon price issues of international equity). Need to protect Australian industries that have good environmental footprint

For industry groups and all levels of government:

- Decrease the misinformation
- Information needs to be timely, independent, relevant

Foundry

Based on Keech Casting (Reduce Consumption of Power)

This group focused on a local Bendigo business, Keech Castings, a foundry business that has been operating in Bendigo as Keech for over 15 years. The company has a longer history as a foundry having least two owners before Keech relocated from NSW (Mascot). The company operates day and evening shifts (primarily for pours). As a foundry it is a 'high energy user'.

Climate impacts

- Cost of power; five per cent of net costs annually relate to energy costs.
- Raw materials increases carbon footprint (specialist sands from Portsea – may be further climate change issues needing to be addressed) therefore recycling important.

Adaptation

- New plant being built
- Melting during day in future - people prefer day shifts therefore process and workforce issues and increase power costs need to adapt to future business plans (strategies being considered at the moment)
- Water small issue only
- Continuity of power critical (heavy cost if black outs) so 'back up' consider going off grid/use technology to be warned about peak issues
- Net exporter of energy is a Keech Casting Company goal for the future and to be self-sufficient on energy (solar/wind/geothermal - prepared to consider all options to overcome energy supply concerns)
- Need to identify partner to get 'global advice' on best options/opportunities
- Recycling sands
- Use of heat etc
- Better technologies available today but capital costs very high for many SME Companies- including Keech
- Waste steel used as base input (recycle steel) – increasing competition from China
- Transportation costs likely to increase and impact further – need for adaptation strategies to plan for these cost spikes to operating budgets

Hazard

- Bushfires / heat waves / losing generation capacity issues. Backup system only intermediate solution – need something that adds value to company where in the future the 'grid becomes the backup'.
- Network security of supply, overseas competitors, carbon taxes are all risks. Must plan for 'increased energy costs' but electricity supply the biggest risk.

Resilience

- Government policies on supply of energy (National grid) where Victoria has private owners and other States owned by Government. This is an important area for further action to support businesses in adaptation to climate change.
- Bendigo to have own energy generation capacity in the future (including renewable energy options) *

Recommendation

- Bendigo to establish own energy generation (renewable) facilities to become self sufficient

Tourism

The group looked at the tourism industry and the risk associated with climate change. An example was given of the impact on tourism at Lake Eppalock. During the drought the water levels dropped so low that there was a speed restriction placed on boats, which effectively stopped water skiing. This led to a substantial reduction in visitors to the region and research by the City of Greater Bendigo at the time estimated the impact to be \$13 million per annum.

Regions depend on climatic conditions to encourage visitors and significant climatic events will impact on visitors to the region. The group concluded there is very little assessment of the risks of climate change on the tourism sector in regional Victoria. Post any major climatic event there is considerable downturn in visitation as people avoid the area (e.g. around Cairns in far north Queensland after cyclones).

The group also discussed the growing interest in ecotourism. The community is becoming more aware of the impact they are having on the environment and there is growing interest in experiencing different environments. This has seen more government marketing to this tourism sector which could be under threat from climatic extremes.

Conclusions

In this think tank we asked: can we identify opportunities and challenges from climatic variability to guide sustainable business development across regional Victoria? It was clear from the several cases presented that large businesses with connections well beyond the region were in fact very much involved in responding to climatic variation, the changing policy settings and likely regulations arising from these. We have less confidence that small retail and service businesses are as well prepared. Their focus is primarily on the day-to-day running costs associated with their business. Knowing that this variation between large and small firms was well reported in the literature and from our own experience of the difficulties small business owners had in attending this one day think tank, we invited the Central Victorian Solar Cities Program to outline an investment opportunity for small businesses in the region to address the likely increases to occur in their cost of energy. This addresses both mitigation and financial adaptation to the impacts of climate change policy.

Awareness and understanding are two underlying issues that need to be addressed when it comes to doing business in a changing and variable climate. As we have mentioned, the politicisation around ways to reduce our carbon pollution and to be more efficient in our energy consumption has meant there is much confusion in the community, including the regional business community, about how best to do this. As such we strongly recommend to VCCCAR and the Victorian Government that they continue to provide information and to build community awareness and understanding

of the choices and consequences of responding to the issue of carbon pollution reduction. We also recommend that businesses prepare for the likely impacts of living and doing business in a changing and variable climate: from the relatively short term impacts of hazardous events such as flood and fire to the long term trends of living and working in a hotter environment (predicted by the Bureau of Meteorology to be at least one degree this century). The changing rainfall pattern - less winter rains to more torrential summer storms - will also impact the way we live in central Victoria, as was so evident in the recent torrential summer rainfalls and resulting record flooding.

From the keynote presentations, likely climate change impacts, adaptation strategies and the nature of recommendations, it is clear that opinions vary about what industries and governments can and should do to assist regional businesses to adapt to climate change impacts. Much more work needs to be done here to inform regional businesses about strategies they can employ to be better prepared for climate change impacts. These are, of course, business investment decisions, and most would be tax effective. They are probably also insurance effective and the information should be presented in this light. The decision to act on such an investment is of course taken in the context of other issues impacting on the business. For some businesses climate adaptation might be a higher priority while for others less so. Operating a riverside tourist park is far more dependent on climatic extremes than say a coffee shop which can simply close up shop when the weather changes. Nevertheless information to improve regional business understanding of the opportunities and challenges from climatic variability as a part of their overall business strategy is an imperative for government. This think tank has been invaluable in that it has allowed the government officials who participated the opportunity to learn firsthand what opportunities and challenges businesses face.

The Don-KRC case study also showed how larger regional businesses are connected to the global economy. Few think tank participants realised that a significant amount of meat used by this company actually comes from Canada where a warmer climate has meant they are able to produce more pork meat appropriate for Don-KRC's smallgoods. In addition to the discussion around the energy issues involved in getting these inputs from Canada, the company's strategy to address a number of its business inputs in the context of consolidating its manufacturing in Castlemaine is also an important factor in its business strategy.

The opportunities for regional businesses in central Victoria operating in a more variable, hotter climate will be realised through their preparedness to plan ahead taking climate into consideration in their business decisions. From a harm minimisation perspective, effective upfront planning will ensure they are in a better position to respond should climate factors, whatever their manifestation, become central. The concern is that so many small businesses are not proactive in this regard and will be exposed to the impacts of climatic change. The opportunity exists for business industry associations to assist members to consider and prepare for possible climatic impacts. An important and relatively easy preparation would relate to evacuation in the face of bush or urban fire during extremely hot and windy summer days, as experienced in February 2009. Of course there are many more business specific adaptation plans due to what they do, where they are located, the likely impacts, and so on. What is important is that each business has a plan relevant to their circumstances.

Appendix 1: Think tank agenda

Think tank agenda

8 am:	Registration and coffee
8.40 am:	<p>Welcome:</p> <p>Professor John Martin, Director Centre for Sustainable Regional Communities, La Trobe University, Bendigo</p> <p>Professor Rod Keenan, Director VCCCAR, University of Melbourne</p>
9 am:	Mr Gavin Hanlon, Managing Director, Coliban Water
9.30 am:	Dr Harvey Stern, Manager Climate Services Centre, Bureau of Meteorology
10 am:	Mr Craig Baldwin, Technical Manager, Murray Goulburn Cooperative
10.20 am:	Morning Tea
10.45 am:	Mr Nick Barber, National Environment & Sustainability Manager Don-KRC
11:15 am:	Group discussions
12 noon:	Lunch
12:45 pm:	Groups report back
1:15 pm:	Ms Lindsey Brown, Office of the Commissioner for Environmental Sustainability
1:45 pm:	Ms Leah Sertori, Project Director, Central Victoria Solar City
2:15 pm:	<p>Panel discussion and question time:</p> <p>Lindsey Brown, Harvey Stern, Craig Baldwin, Leah Sertori, Nick Barber</p>
2:45 pm:	Closing remarks
3:00 pm:	Finish

Appendix 2: Speaker profiles

Professor John Martin

Director, Centre for Sustainable Regional Communities,
La Trobe University Bendigo Campus

John has a strong interest in the institutions and processes that create sustainable communities. He has worked with Australian Local Government over the last 30 years in the area of Councillor, and senior management development. In recent years his focus has been on the strategic management of local government and community and economic development. Over the last decade he has recognized the public policy issues relating to environmental change incorporating this perspective into his sustainable community development work.

John's early training in ecology and natural resource management, before a masters degree in sociology and a PhD in public policy, provides a multidisciplinary perspective on sustainable development. John has worked across Australia for the Federal, State and local governments and in the Asia Pacific and Africa on a range of assignments for the World Bank, the ADB, AusAID and the UNDP. His current research and consulting interests include local and regional governance, agriculture and rural change, and the impact of climate change on regional Australia.

Professor Rod Keenan

Director, Victorian Centre for Climate Change
Adaptation Research, University of Melbourne

Rod Keenan has a B.Sc. (Forestry) from the ANU and a PhD in forest ecology from University of British Columbia. He was formerly research program leader in the Bureau of Rural Sciences and Head of Department of Forest and Ecosystem Science at the University of Melbourne.

He has research interests in forests and climate change, forest ecosystem services, forest resource assessment and environmental policy and has undertaken research in Canada, Japan and Papua New Guinea. He is author or co-author of over 50 refereed journal publications or book chapters and numerous reports to government and industry. He is a member of the UN-FAO Advisory Group for the Global Forest Resource Assessment and Chair of the National Forest Research Priorities and Coordination Committee.

Mr Gavin Hanlon

Managing Director, Coliban Water

Gavin has a background in environmental science and business, and has extensive experience in leadership roles in both catchment management authorities and local government.

He was Chief Executive Officer of the North Central Catchment Management Authority for four years prior to his appointment to Coliban Water, and was Chief Executive Officer of Mallee Catchment Management Authority from 2001 to 2004.

Dr Harvey Stern

Manager Climate Services Centre,
Bureau of Meteorology

Dr Harvey Stern is a meteorologist with the Australian Bureau of Meteorology, and currently heads the Climate Services Centre of the Bureau's Victorian Office. He holds a PhD from the University of Melbourne, for a dissertation entitled 'Statistically based weather forecast guidance'.

Much of his work has related to the development of computer systems for automated forecasting guidance, to long term trends in the accuracy of weather predictions, and to various aspects of climate and climate change.

Dr Stern also holds a Graduate Diploma in Applied Finance and Investment from the Securities Institute of Australia and, in this context, Dr Stern's work includes evaluating the cost of protecting against global climate change utilising options-pricing theory and weather derivatives.

Mr Craig Baldwin

Technical Manager Murray Goulburn Cooperative

Craig has a Bachelor of Applied Science and approximately 14 years ago he commenced at Murray Goulburn Cooperative, initially working in laboratories. He moved into production and then into a technical and environmental role with a major focus on efficiency and energy.

Craig is based at the Cobram office and more recently took on the role of long term strategic planning.

Mr Nick Barber

National Environment & Sustainability Manager
Don KRC

Nick commenced with George Weston Foods in 2001 and was Group Environment Manager from 2003-07 covering 45 sites between Australia and New Zealand, in late 2007 he relocated to Melbourne to lead the development of sustainability in the Don KRC division.

Over the past three years he has led over \$17m investment in sustainability initiatives as part of the expansion of the Castlemaine site, including installation of cogeneration and construction of a best practice waste treatment facility.

Ms Lindsey Brown

Office of the Commissioner for Environmental Sustainability

Lindsey Brown has an Honours degree in Public Affairs and Policy Management from the Arthur Kroeger College of Public Affairs in Carleton University, Canada. She recently completed her Masters in Corporate Environmental and Sustainability Management at Monash University. She has worked in the public and private sectors across three continents; from Canada, to West Africa, and now Australia. Her areas of research have focused on regulation of environmentally dependent industries - particularly mining and water. Her work in the mining industry in Burkina Faso was centred around corporate social responsibility and partnerships for rural development through water infrastructure. Upon moving to Australia, Lindsey worked with the Department of Sustainability and Environment in various roles, including research management, policy coordination for natural resource management, and Landcare. As Senior Policy Analyst at the Office of the Commissioner for Environmental Sustainability, Lindsey provides analysis and advice on policy approaches and interventions by government, industry, and community for the State of the Environment Report.

Ms Leah Sertori

Project Director, Central Victoria Solar City

Leah heads up the Central Victoria Solar City Consortium, which comprises Origin Energy, Powercor, Bendigo Bank, Central Victorian Greenhouse Alliance and Sustainable Regional Australia as lead proponent.

Leah is also CEO of Sustainable Regional Australia. Leah's previous roles include CEO, Australia Cares, various leadership roles in the Victorian Education Department including System Policy and Research, Enterprise Education, Career Education and Project Management.

Leah led the development of Australia's largest business/education partnership 'Schools First' for National Australia Bank; a \$30 million project to improve student learning outcomes through school and community partnerships. Since joining Sustainable Regional Australia Leah has been able to reduce her daily energy consumption at home from 19kW hours per day to 4kW hours per day by implementing energy efficiency measures.

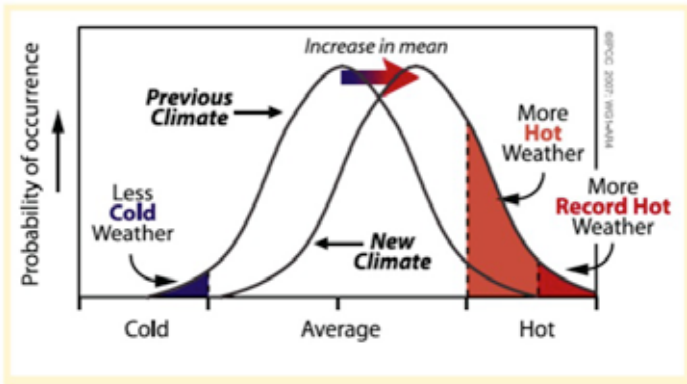
Appendix 3: Keynote presentations

Mr Gavin Hanlon
Coliban Water



Our sustainability challenge

La Trobe Uni Round Table



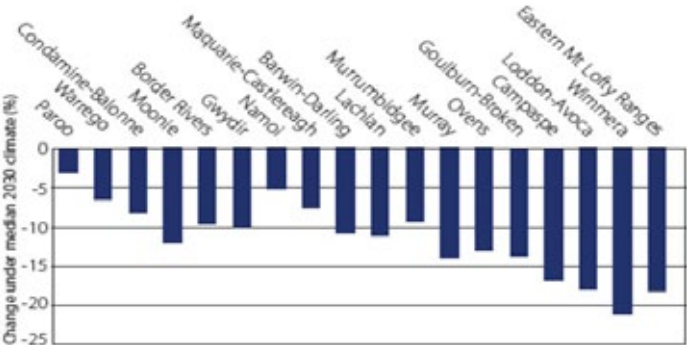
Our Sustainability Challenges and responses

- Water availability
- Extreme weather events
- Energy consumption
- Changing demographic



Our business is about underpinning regional development

Climate change impact on water availability in the Murray-Darling Basin



Source: CSIRO 2008 Water availability in the Murray-Darling Basin. A report to the Australian Government from the CSIRO Murray Darling Basin Sustainable Yields Project CSIRO, Australia. 67pp.

Long-term Outlook

CSIRO has released predictions based on 1°C temperature rise by 2030 and 2°C temperature rise by 2060.

2030 - 1°C Rise	Rainfall	Runoff
Campaspe	-3 to -7%	-7 to -27%
Goulburn	0 to -7%	-3 to -21%
Loddon	0 to -7%	-7 to -29%
Upper Murray	+1 to -8%	0 to -19%
2060 - 2°C Rise	Rainfall	Runoff
Campaspe	-5 to -14%	-13 to -48%
Goulburn	0 to -14%	-5 to -38%
Loddon	0 to -14%	-12 to -48%
Upper Murray	+2 to -16%	0 to -36%



A little about Coliban Water

Towns serviced	49
Population serviced	approx 140,000
Projected growth	1.5% - 2%
5 Yr capital program	\$215M
Annual water required	23,000ML
Supply systems	7

Asset Base ~\$1.5 B

2,151km of mains
40 Reservoirs and service basins,
65 water pump stations,
26 water treatment plants, 70km of main channels

1,750km of Sewer mains,
182 sewer pump stations,
16 water reclamation plants
31km Recycled Water Assets –
494km of Rural Channel

Malmesbury Annual Rainfall (mm)



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Graph - coefficient of variation

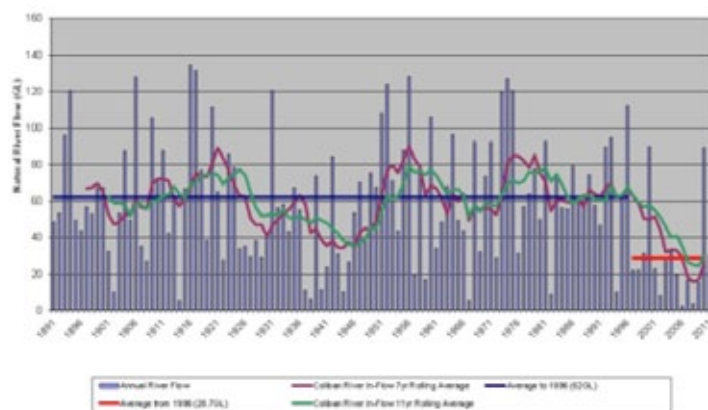
Coefficient of Variation
10 year rolling average

10

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Annual Coliban Storages Inflow (GL)



8

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Our response to reduced availability

- Short term Action
 - › Supply
 - › Interconnectivity
 - › Recycled water
 - › System efficiencies
 - › Demand
 - › Water restrictions
 - › Pricing signals (inclining block tariffs)
 - › Water MAPs programs ("a rose by any other name")
- Long term strategies
 - › Supply and Demand Strategy

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Coefficient of Variation

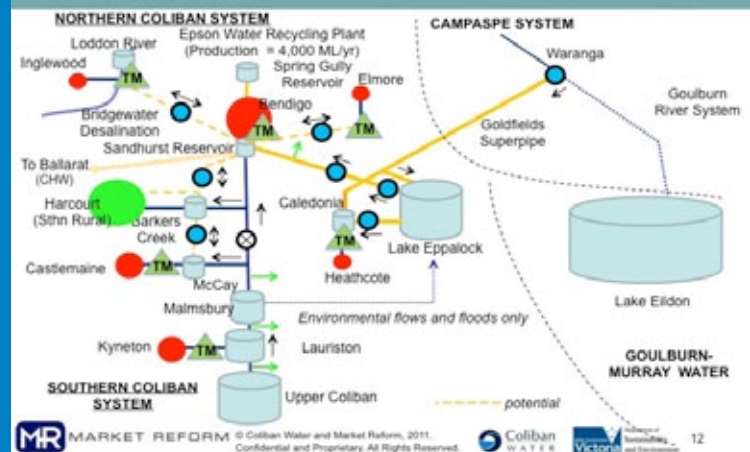
- Ratio of standard deviation to average
- 20th century average: 0.45
- 2011: 1.2
- Climate is undoubtedly more variable
 - For a given average level of inflows, variation is almost three times as great

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Water Security Strategy



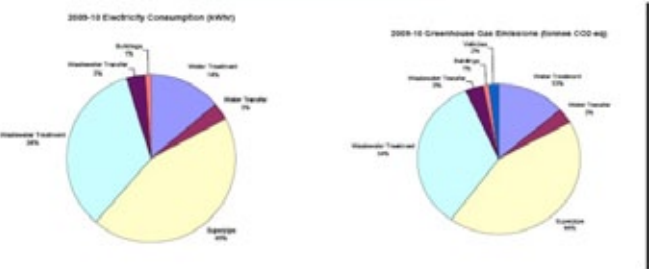
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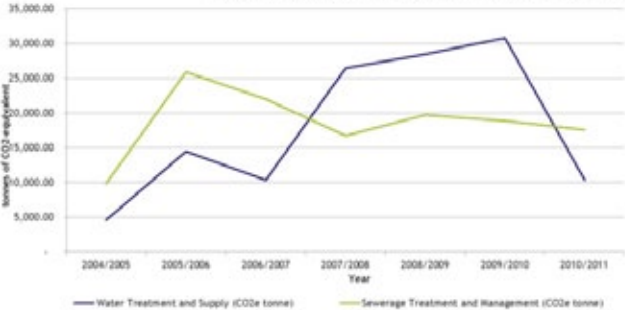
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Coliban Waters

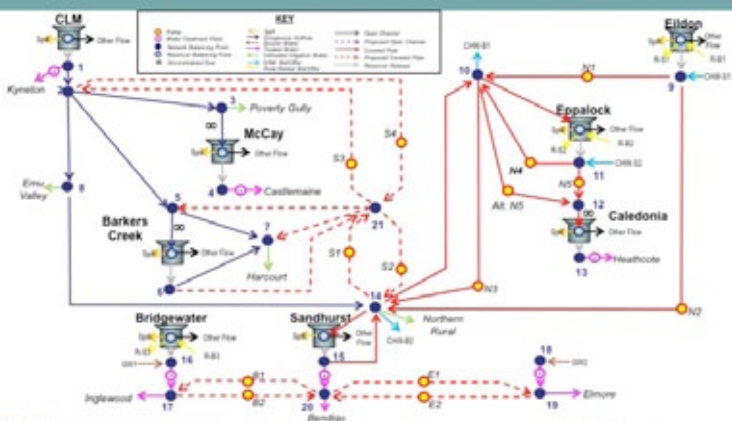
**Coliban Water
2009-10 Energy and Emissions Overview**
Electricity Consumption: 47,134,561 kWh
Energy Usage: 162,844 GJ
Greenhouse Gas Emissions: 11,234 tonnes CO₂-equivalent



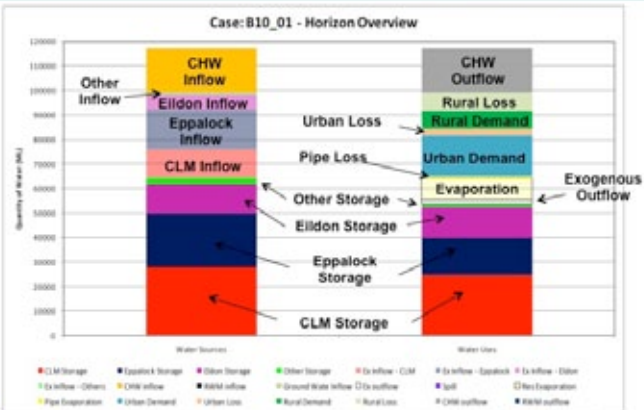
2010-11 Coliban Water Greenhouse Gas Emissions



The System In The DAOP Model



Uses of Water over the Year



Aim: 30% reduction in evaporation

Joint research project:

- Melbourne Uni
- CRC Polymers
- Coliban Water
- Orica



Other Climatic impacts

- Floods
 - › Height of electronics/pumps
- Fire
 - › Generators at large plants



250 climate actions – most useful tool?

Global GHG abatement cost curve beyond business-as-usual – 2030



Note: The curve presents an estimate of the maximum potential of all technical (Gt) abatement measures below €50 per tCO₂e if each year was pursued aggressively. It is not a forecast of what mix of abatement measures and technologies will prevail.

Source: Global GHG Abatement Cost Curve 2.0

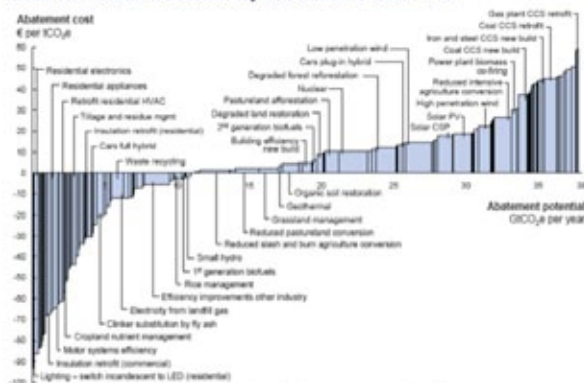
CENTER FOR CLIMATE STRATEGY

Source: McKinsey, Pathways to a low-carbon economy, 2009

Randers 9

250 climate actions ranked by cost

Global GHG abatement cost curve beyond business-as-usual – 2030



Note: The curve presents an estimate of the maximum potential of all technical (Gt) abatement measures below €50 per tCO₂e if each year was pursued aggressively. It is not a forecast of what mix of abatement measures and technologies will prevail.

Source: Global GHG Abatement Cost Curve 2.0

CENTER FOR CLIMATE STRATEGY

Source: McKinsey, Pathways to a low-carbon economy, 2009

Randers 9

Social sustainability considerations

• Demographics

- › One in three customers are concession holders
- › One in two don't know how much water they use
- › One in ten know how to read their meter and do.
- › Seven in ten people over sixty believe we need more dams and supply
- › Seven in ten people under sixty believe we need to be more conservative with water use and that we should lead the charge.
- › Hardship Programs
 - › Payment plans
 - › Change in tariffs

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Medium Long terms

• About to release sustainability strategy

- › Social aspects
 - › GSL
 - › Information availability
 - › Community engagement / partnerships
- › Economic
 - › Optimisation (value and cost driven)
- › Environmental
 - › Alternative energy
 - › Energy recapture (Echuca)
 - › Turbines at Eppalock
 - › Alternative water eg Recycled stormwater
 - › Environment water credits
 - › Land management
 - › Native veg protection

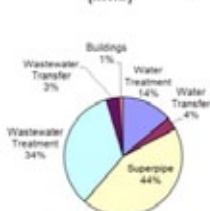
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Why Greener Government Buildings Project for Coliban Water?

2009-10 Electricity Consumption (kWhr)



- Third party audit of energy use
- Business case for change (7 year payback)
- Financed by DTF

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Sustainability is good for business

• Questions?



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Appendix 3: Keynote presentations

Dr Harvey Stern
Bureau of
Meteorology

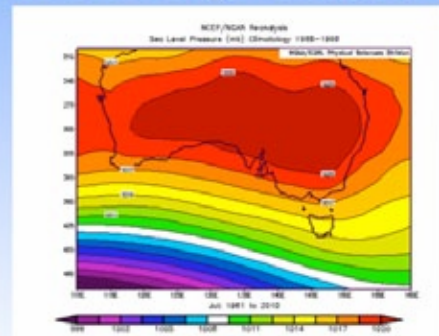
Central Victoria's Variable and Changing Climate

Dr Harvey Stern

Manager, Climate Services Centre,
Bureau of Meteorology (Victorian Office)



Drivers of Bendigo's Winter Climate

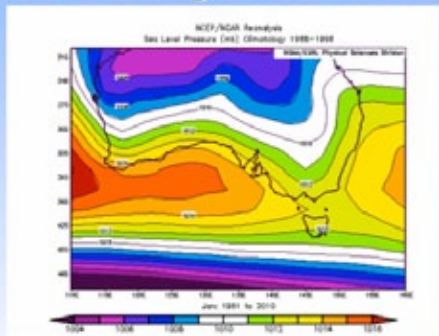


Bendigo's Current Climate

Snapshot: Bendigo has a climate that may be classified as temperate with no dry season and a warm summer. The moderate rainfall is fairly evenly distributed through the year, but is more concentrated in winter. Thunderstorms are more frequent in summer, whilst fog is predominantly a winter phenomenon. In winter, there are severe frosts, whilst in summer there are some very hot days. Days with strong wind are more frequent in spring. During dry years, strong winds generate dust storms, particularly in spring and summer.



Drivers of Bendigo's Summer Climate

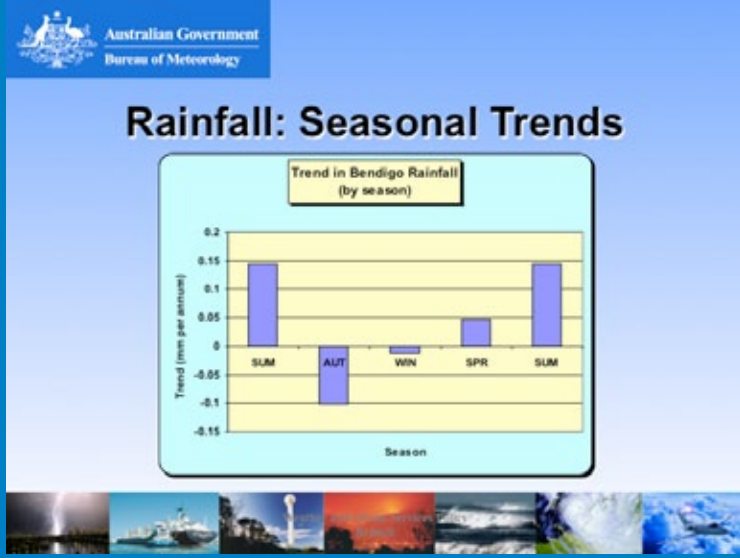
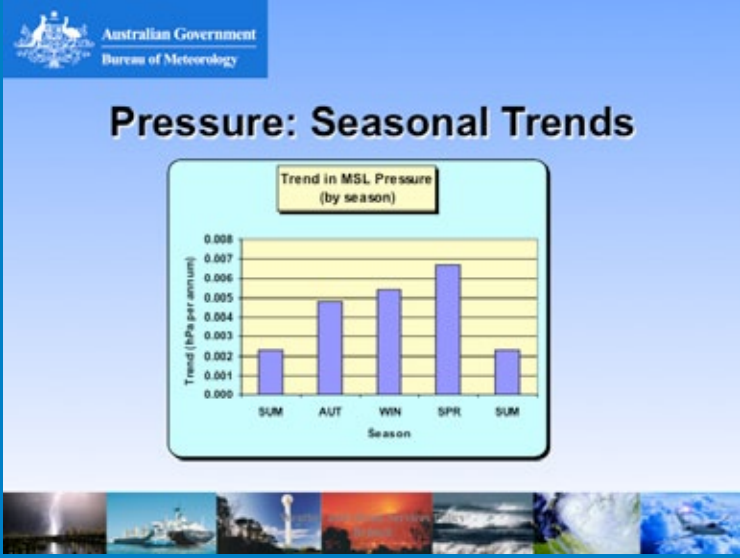
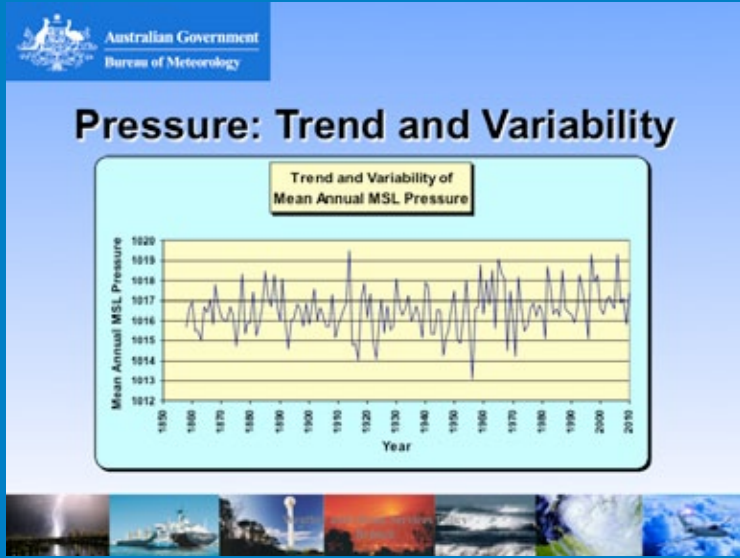
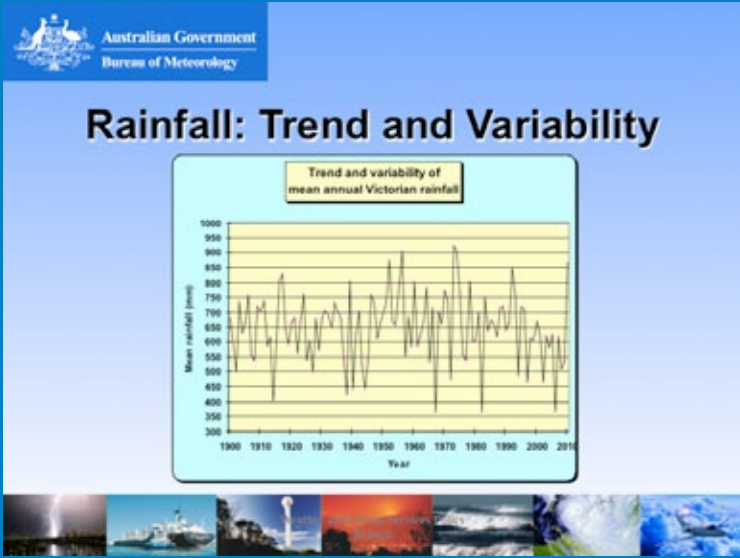
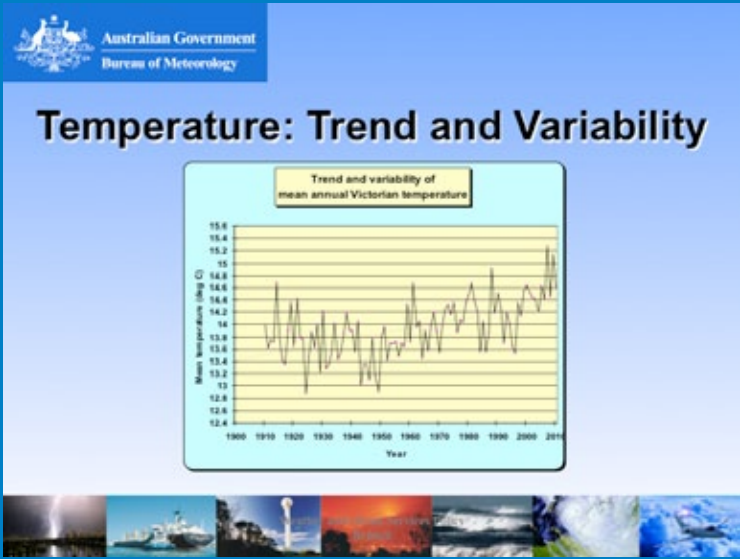
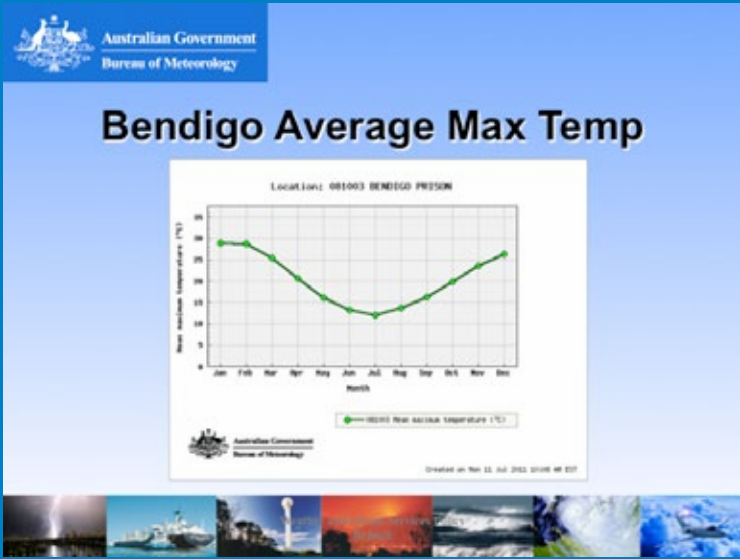


Bendigo Average Rainfall



Bendigo Average Min Temp





Appendix 3: Keynote presentations

Mr Craig Baldwin
Murray-Goulburn
Cooperative

Industry Adaptation Case Study Murray Goulburn Co-Operative



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INTRODUCTION



- Parsons Brinckerhoff Australia (PB) was engaged by Australian Industry Group (AIGroup) to identify climate change risks to Murray Goulburn Co-operative's Cobram facilities in northern Victoria, assess the implications of the risks for the business and identify appropriate adaptation strategies.

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COMPANY BACKGROUND



- The Murray Goulburn Co-operative (MG) is a world class supplier of dairy ingredients and retail products. It processes over 35% of the nation's milk supply into quality products which are sold on both domestic and export markets. Murray Goulburn manufactures and markets a full range of dairy ingredients including skim milk powder, full cream milk powder, cheese, milk fat products, whey powders and milk proteins.
- The Cobram facility was established in 1951 by a cooperative of local farmers. It was the first facility to be registered as the Murray Valley Co-Operative Dairy Produce and Trading Company. It remains wholly owned by Australian dairy farmers.
- The major products manufactured by the Cobram facilities are:
 - Cheese, bulk and retail
 - whey powder
 - whey protein concentrate
 - whey protein isolate
 - lactose
 - Infant formula powders
- 70% of the products are exported, with annual sales revenue of ~\$450 million.

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PARTICIPANTS BRIEFING



TABLE 1: COBRAM AREA – CLIMATE CHANGE PROJECTIONS

Variable	Present	Projected Change 2030	2070
Average Rainfall – annual	Adequate	-4%	-10%
Average Rainfall – summer		-7%	-8%
Average Rainfall – autumn		-2%	-5%
Average Rainfall – winter		-5%	-12%
Average Rainfall – spring		-7%	-20%
Relative Humidity	-	-0.6%	-2.2%
Average daily temperature – annual	15.6 deg C	+0.8 deg C	+2.8 deg C
Average daily temperature – summer		+1.0 deg C	+3.2 deg C
Average daily temperature – autumn		+0.8 deg C	+2.8 deg C
Average daily temperature – winter		+0.8 deg C	+2.2 deg C
Average daily temperature – spring		+1.0 deg C	+2.8 deg C
Number of hot (>35 C) days per year	18 days	25 days	46 days
Average number of runs per year of very hot days (3-5 consecutive days exceeding 35 C)	2.8 runs	4.4 runs	10.5 runs
Average of Extremely Hot (>40 C) days per year	1.6 days	3.1 days	11 days
Average of runs of extremely hot days (a run is 3-5 consecutive days exceeding 40 C)	0 runs	0.3 runs	1.8 runs
Average number of Frosts per year (>5 C)	86	31	17
Total Precipitation	-	+0.4%	+1.3%
Potential average annual evaporation	-	+7%	+7%
Bush Fire risk (average number of days per year when Forest Fire Danger Index (FFDI) is extreme)	1.2 days	1.9 days (2030)	3.4 days (2070)
Rainfall intensity – extreme daily	-	+2% (2030)	+4%
Wind speed (% increase relative to average annual 10 m wind speed derived from relatively coarse Global Climate Models, however the warmer atmosphere is likely to cause increased gusts at the finer spatial and temporal scales)	-	+1%	0%

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The main resources used each year in processing at the Cobram facilities:



Resource Parameter	Quantity
Annual potable water use	1,842 ML / year
Annual irrigation water use (for diluting wastewater)	1,422 ML / year
Annual electricity use	64,802,752 kWh
Natural gas consumption	2,549,293 GJ/year (80% energy profile)
Production area	25,000 m ²
Storage area	45,000 m ²
Wastewater treatment plant, aerobic treatment	2,279,300 m ³
Purchased steam: Provided by a third party that use briquettes (from the Latrobe Valley) as a fuel source	1,464,284 GJ/year (20% energy profile)

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METHODOLOGY

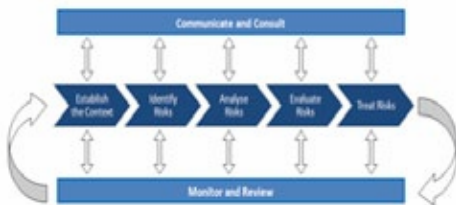


- The Murray Goulburn Climate change risk assessment and adaptation project was undertaken in accordance with the Australian Government's publication *Climate Change Impacts & Risk Management: A Guide for Business and Government* (AGO, 2006). This is based on the risk management framework in AS/NZS 4360 Risk Management (Standards Australia, 2004) and its supporting Handbook HB4360 (Standards Australia, 2004A).

The risk management approach consists of five consecutive steps, namely:

- Step 1: establish the context
- Step 2: identify the risks
- Step 3: analyse the risks
- Step 4: evaluate the risks and
- Step 5: treat the risks.

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- Stage One: Screening of adaptation risk - encompassing Steps 1 and 2;
- Stage Two: Assessment of the implications for business - including Steps 3 and 4
- Stage Three: Identification of adaptation strategies addressing Step 5 of the process.

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RESULTS

Stage One: Screening of adaptation risks

A total of 43 risks were identified against the five key elements.

- Five Key Elements
 - Energy and Resources (ER): key resource inputs (energy, water, ingredients) and risks to milk supply.
 - Labour and Human Resources (HR): employee health and safety, fitness to work, employment and retention.
 - Markets (MK): domestic and export markets
 - Supply Chain (SC): distribution and transport of inputs and outputs from the Cobram facilities.
 - Manufacturing Operations and Assets (OA): includes onsite process and infrastructure risks associated with climate change impacts.
- These risks were identified by Cobram team and reviewed at a separate corporate briefing.

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Stage Two: assessment of the implications for business

- The risk assessment rated one individual risk as "extreme", 14 as "high", 24 as "medium" and 4 as "low" risk.
- The areas of greatest climate change risk to MG's Cobram Business are:
 - reduced availability of water
 - higher energy and related costs
 - extreme weather events

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EXAMPLE OF RISK ANALYSIS & EVALUATION RESULTS

Risk No.	Climate Variable	Projected change	Impact	Existing Primary Controls	Existing Secondary Controls	Consequence	Likelihood	Initial Priority
Extreme Priority Risks								
ER-CCS	Climate change generally	Cumulative effect of reduced water availability on dairying in Northern Victoria lead MG to consolidate processing at Cobram.	Costs of upgrading the waste water treatment facilities and the main power line to the Cobram plant	Sharing of milk and milk processing amongst the three MG plants in northern Victoria, and further ahead if required	Greater centralisation of milk processing in central Victoria will impact MG's flexibility to shift processing between facilities	MAJOR	ALMOST CERTAIN	Extreme (3)
High Priority Risks								
ER-AR2	Average annual rainfall	Decreased average annual rainfall and higher temperatures, results in blue green algae in Murray River water extracted by Goulburn Valley Water (GVW) for potable use in Cobram, causing	Substantial reduction in quantity of filtered town water supplied to the MG plant, also risk to dairy cattle from drinking water with blue green algae	Water extracted from river is passed through carbon filters to remove algae Farmers use alternative sources for stock watering	GVW considering adding additional carbon filter cells at Cobram to avoid water restrictions when river water has to be treated to remove blue green algae	MAJOR	LIKELY	High (2)
ER-AR3	Annual and seasonal rainfall	Reduced rainfall and water allocations for irrigated pastures.	Decreased availability of water for irrigation and increased costs of water (sewer increased cost of milk production)	Build confidence in industry through public advocacy for sufficient water allocations to maintain dairy industry in Goulburn Murray irrigation district	Improve on farm water use efficiency	MAJOR	LIKELY	High (2)
ER-AR1	Average annual rainfall	Decreased average annual rainfall, causing less runoff into storage, resulting in water restrictions on irrigation and/or town water.	Inadequate availability of water for irrigation or much higher costs of irrigation water - which is essential for diluting the waste water before it can be disposed of by irrigating on farms	Offset existing water allocations to secure water needs		MAJOR	POSSIBLE	High (3)

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ADAPTION STRATEGIES

Stage Three: Identification of adaptation strategies

- In the final stage of the workshop, participants identified possible adaptation actions and nominated the Murray Goulburn manager likely to be responsible for implementing each action. An example below summarises the adaptation actions proposed for the 'Extreme' risk.

Risk No.	Climate Variable	Projected change	Impact	Adaptation Action	Responsible MG Manager
Extreme					
ER-CCS	Climate change generally	Cumulative effect of reduced water availability on dairying in Northern Victoria lead MG to consolidate processing at Cobram, necessitating	Costs of upgrading the waste water treatment facilities and the main power line to the Cobram plant	Upgrade the waste water treatment facilities and the main power line to account for increased production.	General Manager Operations

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ADAPTION STRATEGIES

Adaptation Strategies were identified to treat all extreme and high priority risks.

- **Water Adaptation Strategy** – climatic 'driver' is less annual rainfall and higher evaporation, causing more severe droughts and higher water losses, resulting in less water available for processing and waste disposal at factory and milk production on farms.
- **Energy Adaptation Strategy** - climatic 'driver' is higher extreme temperatures, more severe heat waves and climate change generally (carbon pricing increasing energy, fuel, chemicals, fertiliser and transport costs), causing higher energy and related costs (e.g. transport, chemicals, fertilisers, pumping, refrigeration).
- **Extreme Weather Adaptation Strategy** – climatic 'driver' is more severe or frequent wind, storms and floods and extreme temperatures causing damage to buildings and equipment, supply chain disruptions, interruptions to power supply at the MG Cobram facilities and on the dairy farms.

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Water Adaptation Strategy

- Upgrade of the waste water treatment facilities and the main power line to the Cobram site to account for increased production.
- Liaise with GVW to develop a future water supply strategy
- Field service team working directly with farmers and support programs that build confidence in the future of dairy in region
- Review "qualified" Water Right rules for water allocations to secure preferential access to dilution water
- Greater use of enzyme-based cleaners to lower conductivity of wastewater and hence amount of water to dilute prior to irrigation.
- Purchase sufficient high security water to cover sites needs
- Strengthen established measures managed by Victorian DPI to prevent/control/respond to disease outbreaks
- Above adaptations actions would also help mitigate or avoid some of the group multiple coincident risks.

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Energy Adaptation Strategy

- Rationalisation of milk collections
- Develop new technologies to reduce volume of liquid transported
- Development of long term energy strategy (i.e. tri-generation, cogeneration, power generation, other renewable options)
- Bulk purchase to reduce cost of supplies (strategic procurement)
- Participate in industry wide efficiency programs (i.e. Sustainability Victoria, Dairy Australia, EREP, EEO)

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Extreme Weather Strategy

- Upgrade all switchboards to cater to a greater temperature range
- Smoke scrubbers on ingress air line, air filtration
- Replace cooling towers with increased capacity and larger heat rejection capability, adiabatic.
- Redesign process to introduce turbine technology to steam desuperheaters
- Review capacity of entire stormwater system at Cobram facilities
- Develop flood mitigation plan for the site
- Develop appropriate contingency plan for extreme rain fall events
- Above adaptations actions would also help mitigate or avoid some of the group multiple coincident risks.

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CONCLUSION/RECOMMENDATIONS

The key recommendations from this study are that MG should:

- Develop and implement a company-wide risk management framework linked to corporate reporting and Key Performance Indicators.
- Integrate climate change risks and adaptation actions/strategies into MG's company-wide risk management framework
- Nominate a senior management position to 'own' each climate change risk and adaptation action/strategy
- Nominate a general manager or director level position to manage the company's climate adaption strategy
- Develop and implement a climate change adaption communication strategy that supports the education of employees, shareholders and external stakeholders initially and on an ongoing basis.
- Actively maintain relationships with industry bodies to obtain up to date climate change information tools and support.
- Monitor progress on climate change adaption strategies and incorporate the findings into company's overall strategic planning.

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CONCLUSION/RECOMMENDATIONS Continued

- Review and update climate change strategies at least every 3-5 years.
- Repeat the Maturity Matrix self assessment every 3 to 5 years to assess the adaptive capacity within the business and integrate the results into the review and revision of the company's climate change adaption strategies and overall corporate strategy.

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Thank you



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Appendix 3: Keynote presentations

Mr Nick Barber
Don-KRC

Environment & Sustainability at Don KRC Castlemaine

Regional Business Development in a Variable and Changing Climate

Nick Barber
National Sustainability Manager



1

Topics

1. Who we are and what we do
2. Energy & Emissions
3. Water & Wastewater
4. Solid Waste



2

Energy and Emissions

- Leading member of the Maines Power project, a joint initiative between industry and the community in Castlemaine aimed at reducing emissions by 30%
- CSIRO identified that:
 - Typical efficiency coal fired is about 25%
 - Line loss in electricity transport to Castlemaine was 15%
- Recommended using localised energy sources such as cogeneration to replace grid supply



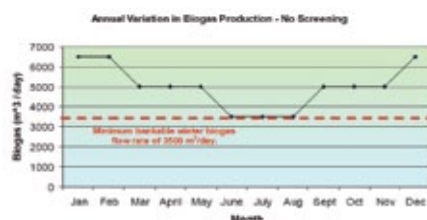
Cogeneration

- The business installed a cogeneration plant
 - 2 x 18 cylinder 2MW (elec) Natural Gas engines
 - 40% efficient in electricity generation with a further 40% capture of heat for steam and hotwater
 - Will generate over 50% of the electricity for the site
 - Will deliver more than a 30% reduction in CO_{2-e} compared to grid supply



Bears Lagoon Biogas

- Biogas capture, monitoring and flaring project has been underway for more than 5 years
- Involved enclosing the anaerobic lagoon and installing a methane flare
- Average daily flow of 5,000m³ of biogas at 65% methane



Bears Lagoon Biogas

- With assistance from AI Group completed a pre-feasibility project to determine whether installation of generators on site is viable
- Determined up to 260kW capacity could be installed
- Would be sufficient to supply all electricity needs and replace LPG use



Energy Efficiency

- P6 administration building designed to Greenstar guidelines
 - Lighting, building materials, temperature control
- Further energy usage reduction projects being identified by comprehensive data capture
 - Services and processes
- 5,000 trees being planted in 2011



Water

- Water (and chemical) usage reduction
 - Smarter cleaning
 - Mother and daughter cleaning stations, expect 15% reduction
 - Clean In Place systems
 - Automatic bin washers throughout plant
 - Water saving fittings



Water

- Rainwater harvesting from roof
 - 800KL harvesting capacity will replace 8ML of potable water
 - Water used for cooling towers, toilets & truck washing
- Comprehensive sub metering for further reduction opportunity identification
- Low water use facilities and gardens



Tradewaste

- Reduced volume due to water saving initiatives
- High salt content liquid separated and removed from local water treatment stream
- More efficient water treatment process for better waste water quality (DAF plant) and odour control (biofilters)
- STAR W research project
 - Research project co-funded by Sustainability Victoria
 - Biological treatment of waste water
 - Aim to achieve natural treatment of waste water and recovery of water for reuse



Solid waste

- Cardboard recycling
- Plastics recycling
 - First in Australia to gain AQIS approval
 - Currently 4-6T of plastic diverted from landfill weekly
 - Potential to recycle >90% of plastic waste
- During Construction over 80% of building construction waste was recovered and recycled



Management systems

- Dedicated environmental team on site
 - Cleaner production and EPA principles
- Environmental Management System will be certified to ISO14001, August 2011



Appendix 3: Keynote presentations

Ms Leah Sartori
Central Victoria
Solar City



Presentation to VCCCAR Regional Business Development Think Tank

Leah Sertori



Anticipated Outcomes

- reduced impediments to the uptake of distributed solar generation
- a critical mass of solar technologies and energy efficiency and load management measures
- enhanced technology leadership in the development of photovoltaic systems
- **real world application of smart meters and cost-reflective pricing to enable these technologies to be appropriately valued.**
- The projects will enable the collection of valuable data to assess the **impact that solar technologies, energy efficiency and load management measures have on electricity supply and demand profiles (in particular peak loads)**, investment in electricity network augmentation, greenhouse gas emissions intensity and the physical operation of the electricity system in the region.



The greenest kWh
is the one
we don't use.

What's the cost of Australia's peak consumption of electricity?

"Peak demand growth is a key issue for electricity distribution networks around the world"

In 2010 approximately 13% of ENERGEX's \$8 billion network was utilised for only 100 hours of the year

This is a trend that has been worsening over the last decade"

Terry McConnell, Energex



"Today, in much of the world we take energy for granted..."

We treat it as a right and we're careless in its use... In order to reliably meet that greater energy need, power companies have to invest in additional capacity which is unused for much of the day."

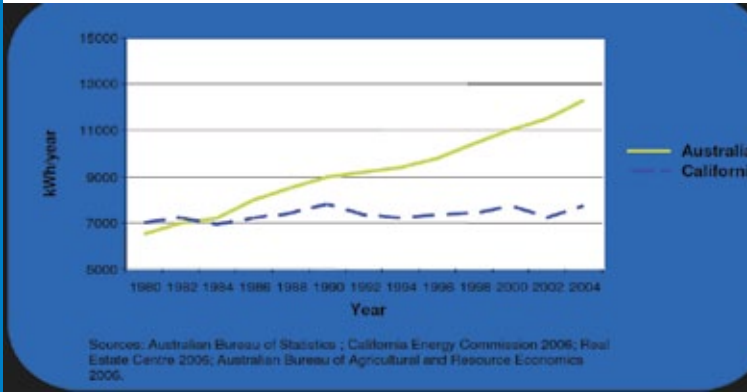
Russell Caplan, Chairman of Shell companies in Australia

"What are the barriers, what are the opportunities"

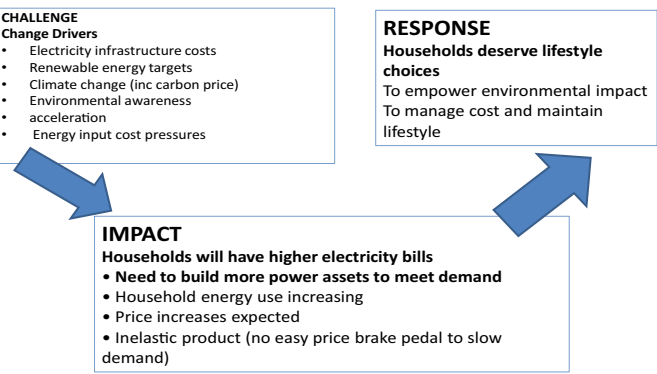
- Where there is a need for new capacity in the grid distributors can invest in augmenting the grid or invest in energy conservation and demand management.
- Nationally the Australian Network operators are planning to spend over **\$47 billion over the next five years** on the grid

There has to be a better more sustainable way

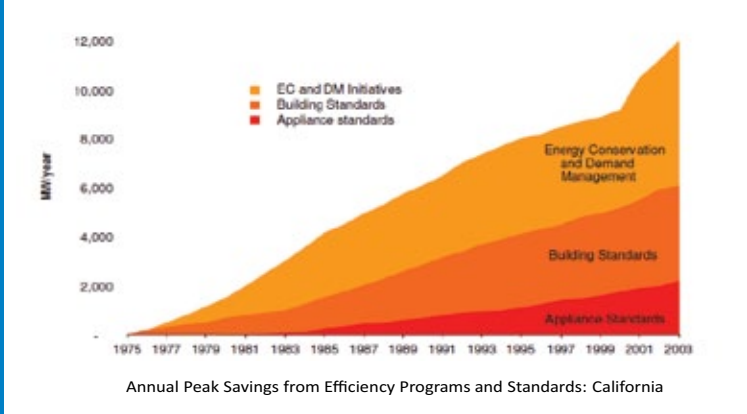
Per Capita Electricity Consumption
Australia vs California



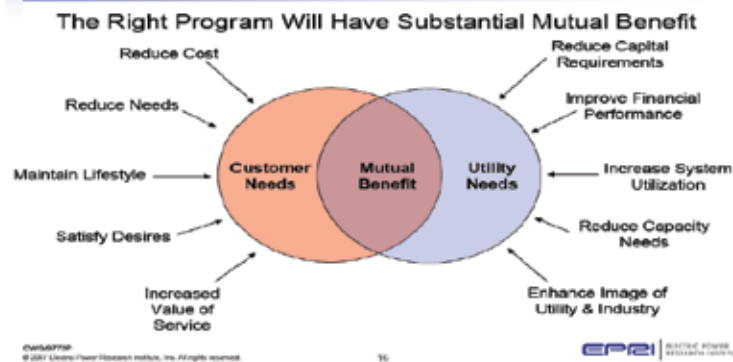
Customers will need options to manage their energy costs



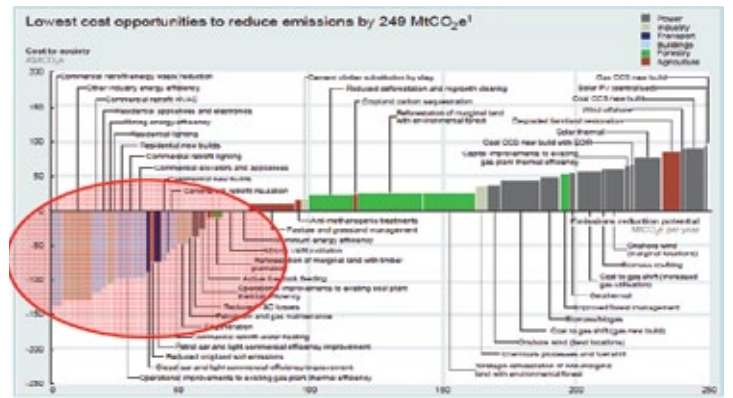
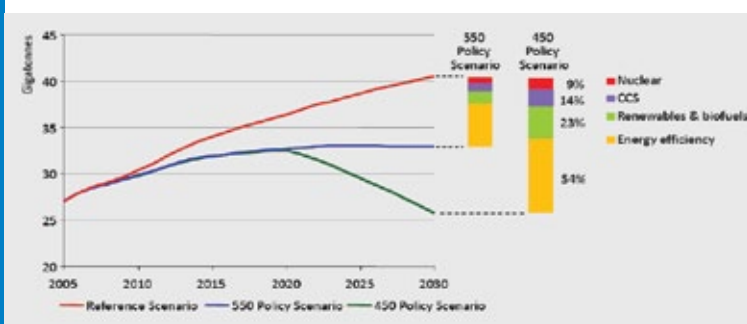
The critical role of energy efficiency programs



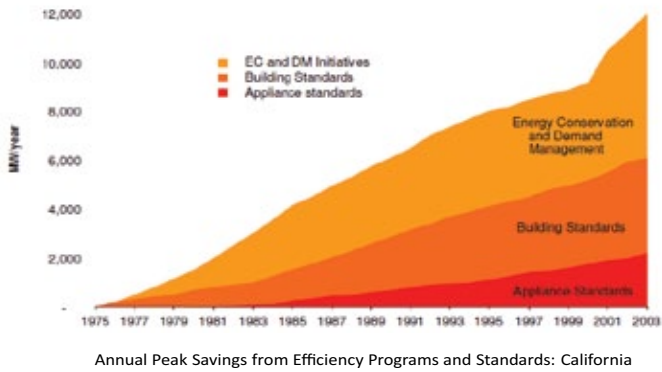
Design Program to Meet Customer and Utility Needs



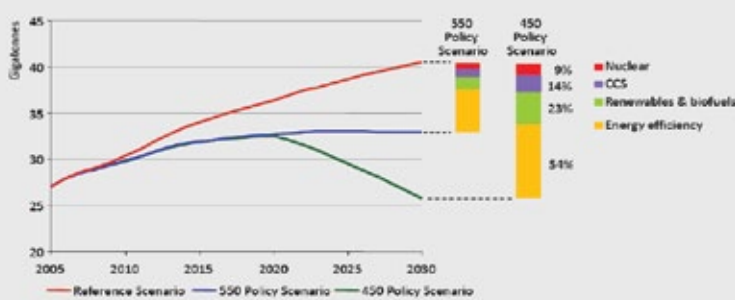
Forecast savings of greenhouse gas emissions



The critical role of energy efficiency programs

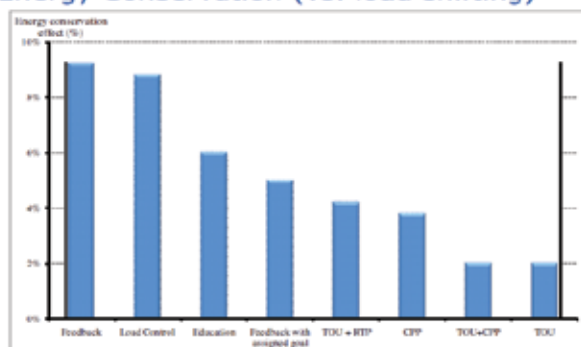


Forecast savings of greenhouse gas emissions



Source IEA, taken from Energy Efficiency Council Presentation

Energy Conservation (vs. load shifting)

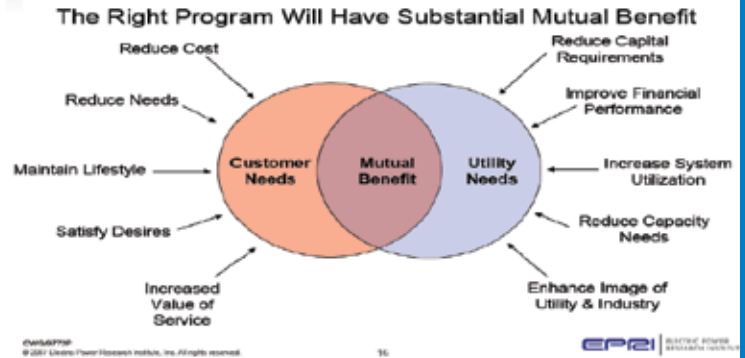


- Corporate Affairs
- June 2011
- AGU, External

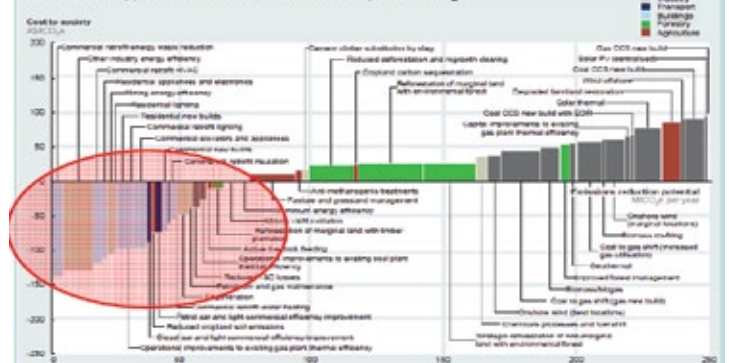
10



Design Program to Meet Customer and Utility Needs



Lowest cost opportunities to reduce emissions by 249 MtCO₂e¹



Anticipated Outcomes

- reduced impediments to the uptake of distributed solar generation
- a critical mass of solar technologies and energy efficiency and load management measures
- enhanced technology leadership in the development of photovoltaic systems
- **real world application of smart meters and cost-reflective pricing to enable these technologies to be appropriately valued.**
- The projects will enable the collection of valuable data to assess the **impact that solar technologies, energy efficiency and load management measures have on electricity supply and demand profiles (in particular peak loads)**, investment in electricity network augmentation, greenhouse gas emissions intensity and the physical operation of the electricity system in the region.



Australian Government
Solar Cities





- Small company established by Central Victorian Greenhouse Alliance in 2008.
- Lead proponent of the Central Victoria Solar City Consortium.
- Current owner of Bendigo and Ballarat Solar Park.
- Strategy includes the sale of both parks to the local community via an Independent Public Offer, (IPO.)
- Based in Castlemaine, Central Victoria.

Key achievements to date

1. Design and construction of two 300kW Solar Parks in Bendigo and Ballarat.
2. Re-design and launch of household product suite on February 1 2011. CVSC have now engaged 2,300 households in the research trial, (control and intervention groups.)
3. Development of Energy Efficiency Education programs for the residential market and for small business.
4. Developed Energy Assessor training program.
5. Community education and engagement in Energy Efficiency
6. Community engagement in the project and appetite for community owned and operated green power.



The Research Trial

CVSC engaged the University of Ballarat to design and manage a longitudinal research program to measure the effectiveness of each 'intervention' offered.

UB are contracted to measure the effectiveness of:

1. Products and services for the residential market.
2. Products and services for small business.
3. Interventions offered to hospitals, (Ballarat.)
4. The effectiveness of the program overall.

We are currently seeking a revision to the scope of the contractor agreement to include an evaluation of our micro-engagement model in Newstead.



Key questions we hope to answer

1. What influence have technological, behavioural, social and economic factors on energy consumption?
2. What is the influence of these factors on household adoption of solar energy technologies?
3. How do demographic, geographic and attitudinal characteristics influence the use of technological interventions and the demand for power?
4. Which combinations of measures provide the best cost route to achieving the most carbon efficient energy consumption for given levels of wellbeing?
5. What are the characteristics of a predictive macro model that explain the impact of household demand and supply management on future energy use and carbon emissions?
6. How can results from such programs be effectively communicated to users?

CVSC Demand Management Trial

1. Increase Energy Literacy
2. Medium Scale Solar Parks
3. Critical Peak Pricing Tariff
4. Extended Time of Use Tariff
5. In Home Display (IHD)

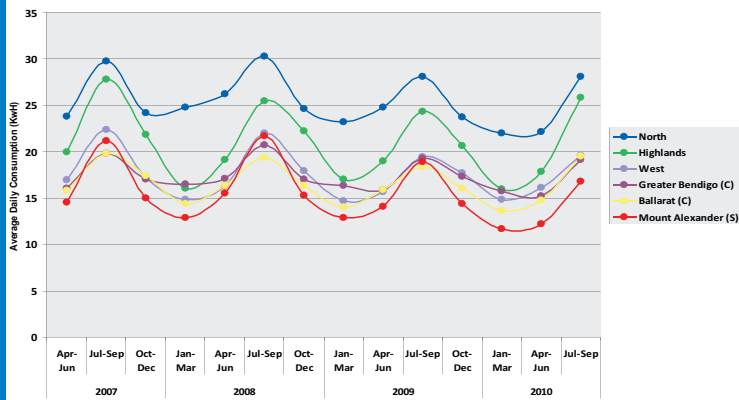


1. Increasing Energy Literacy

- CVSC offers a free 90 minute Home Energy Assessment.
- To date, CVSC has delivered 1,750 Home Energy Assessments across 14 municipalities in Central Victoria.
- Home Energy Assessments are the primary engagement tool to engage the customer in CVSC packages including:
 - Retrofit
 - Solar Hot Water
 - Household Solar PV
 - Demand Management offer (now In Home Display)



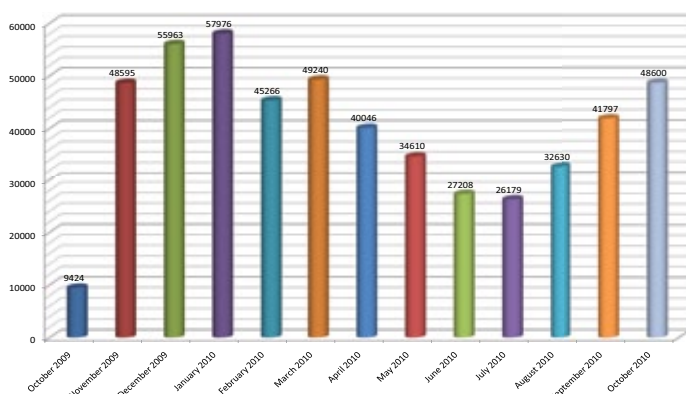
Impact of Increased Energy Literacy in Mount Alexander Shire



2. Our Solar Parks in Bendigo and Ballarat

- Demonstrate the effectiveness of medium scale solar (our parks 300kW.)
- Demonstrate a model incorporating community ownership of the parks.
- Explore the policy settings required to take the model to scale.
- Explore the production capability of the parks in different settings.
- Test storage and release of power during peak load times.
- Explore the issues related to construction and grid connection.

Bendigo Solar Park 12 months Net kWh Production

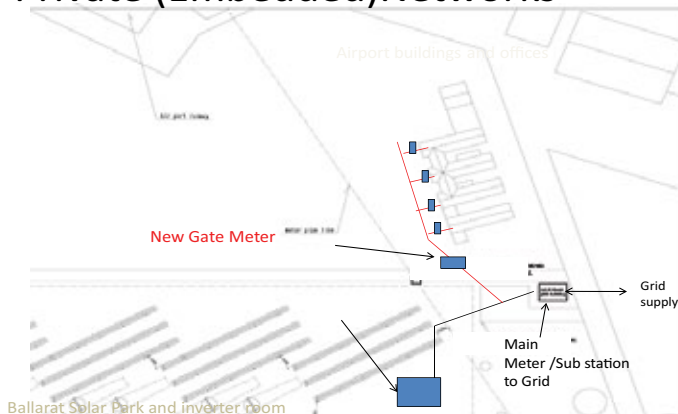


Ballarat Solar Park



Opportunity to test Private Network

Private (Embedded) Networks



Ingredients for Success

1. Feed in Tariff
Provided to community owned and operated assets for a fixed period, (3-5 years.)
2. Supportive Power Purchase Agreement
3. Specialist expertise in the design and construction phase and ongoing maintenance support.
4. Supportive retail partner or large supportive customer to secure a premium price for green power generated by the asset.
5. Low grid connection fees.



Victoria vulnerable as heat rises

By GEOFF MASLEN

VICTORIA'S electricity grid came close to failing and shutting down the entire state during last year's unprecedented heatwave, according to a report to be released in Melbourne tomorrow.

Prepared by a team of researchers at five Australian universities, including RMIT and Monash, the report reveals that demand on electrical power was excessive and that govern-

and will "test the resilience of the expanding metropolitan areas unless forewarning and other adaptation strategies are successful".

The federal National Climate Change Adaptation Research Facility commissioned the report, which is based on a lengthy study by the 16 researchers. Lead author Jim Reeves says heatwaves do not have the same impact in the

"The timing of the bushfires eclipsed the heatwave and thus reduced opportunities for publicising its impacts and for reflection and learning. It should not be overlooked that as many as 500 people may have died as a result of the heatwave in Adelaide and Melbourne," the report says.

But Melbourne's electricity system stands out as being the most susceptible. So severe was

Customers Health and Wellbeing

1. Some customers are more susceptible to heat stroke than others.
2. CVSC required a filtering mechanism to 'educate' and 'engage' the customer on the basis of suitability for a critical peak pricing plan.
3. CVSC developed Guidelines for sale of the product.
4. CPP not suitable for customers who were elderly and living alone, young families with no access to transport

Customer Health (cont.)

- Guidelines for sale approved by all CVSC Consortium Members.
- Members of our Home Energy Assessment Team (HEAT) trained to identify at risk customers by St. John's Ambulance.
- Members of the HEAT team supported by educational collateral/messaging/list of Do's and Don'ts.
- Origin's Terms and Conditions included the guidelines, exemption during catastrophic bushfire days.
- In Home Displays programmed to display price in two settings, (off peak, 12centspkWh, peak, \$2.10pkWh.)

Findings

- There are currently no national guidelines for critical peak pricing.
- There is little awareness and understanding of the benefits and potential dangers of cost reflective pricing in the general community.
- There is no independent information on the social, economic and environmental benefits of cost reflective pricing for the general public.
- In the Victorian context, there is an overwhelmingly negative response to smart metering.
- The most significant barrier to take up of CVSC's free Home Energy Assessment are customers who would prefer not to have a smart meter installed.

Findings (cont.)

The Energy Industry are signalling a pricing revolution:

"The telecommunications industry is not like it was 15 years ago, it has experienced radical change. That's what is going to happen to energy over the next ten years, so we want to be in the best position to manage that."

Phil Craig, Origin
announcing Origin's IHD pilot

Our experience suggests that the general public need to be taken on a journey, **highlighting the rational for change** and **educating consumers** about the cost benefits. The health and social impacts of cost reflective pricing require greater **research and dialogue** and the government will need to play a bigger role in ensuring that consumers health and wellbeing are not compromised in the energy revolution.



Key Challenges for the program

1. How can we better report emerging findings from the CVSC Trial to all stakeholders?
2. How can we share lessons learnt across government departments, DPI, DEECD, DRET?
3. How will we validate emerging findings within the consortium/broader CVSC family prior to dissemination?
4. Who are the primary audiences for the lessons learnt from the CVSC trial?

Appendix 4: Participants

Mr	John	Anstey	General Manager, Strategy & Planning	Coliban Water
Mr	Abhi	Awasthi	Transition & Student Engagement Officer	La Trobe University
Mr	Craig	Baldwin	Technical Manager	Murray Goulburn Coop
Mr	Nick	Barber	National Environment & Sustainability Manager	Don-KRC
Ms	Lindsey	Brown	Senior Policy Analyst	Office of The Commissioner for Environmental Sustainability
Mr	Frank	Cinquegrana		Workspace Australia
Ms	Karen	Corr		EcoSuccess/Bendigo Sustainability Group
Mr	Chris	Coughlan		Goldfields Local Learning & Employment Network
Mr	Jonathan	Creese	Agribusiness Research Analyst	Rural Finance
Mr	Jim	Dannock	Regional Manager	Australian Industry Group
Mr	Derek	de Vrieze	Community Banking Manager	Mecu Limited
Ms	Linda	Duffy	Climate Change & Sustainability Services	DSE
Mr	Brian	Gould	Manager Economic Development Unit	City of Greater Bendigo
Prof	Jane	Hamilton	Regional School of Business	La Trobe University
Mr	Gavin	Hanlon	Managing Director	Coliban Water
Mr	John	Harvey	Executive Officer	Central Victorian Greenhouse Alliance
Mr	Herbert	Hermens	CEO	Keech Castings
Ms	Patricia	Ibbotson	Conf Mgr CSRC	La Trobe University
Prof	Rod	Keenan	Director VCCCAR	Melbourne University
Ms	Zerin	Knight	Media Liaison	La Trobe University
Prof	John	Martin	Director CSRC	La Trobe University
Mr	Ross	Martin	Climate Change & Sustainability Services	DSE
Dr	Eve	Merton	Research Fellow	La Trobe University
Mr	Peter	McKean	Manager Learning Partnerships	Continuing Education Bendigo
Mr	Sonny	Neale		Central Victoria Solar City
Mr	Wayne	O'Toole	Economic Dev Officer	Mount Alexander Shire Council
Mr	Peter	Renfrew		Enterprise Connect
Cr	Keith	Reynard	Councillor	City of Greater Bendigo
Mr	Neil	Rowan		Dept of Regional Australia, Regional Development & Local Government
Ms	Leah	Sertori	Project Director	Central Victoria Solar City
Ms	Julia	Stanley	Climate Change & Sustainability Services	DSE
Dr	Harvey	Stern	Manager Climate Services Centre	Bureau of Meteorology
Mr	Arvid	Yaganegi		Vic Occupational Training Educational Services

Appendix 5: Framing climate change adaptation in policy and practice

Executive Summary by Hartmut Fuenfgeld and Darryn McEvoy April 2011

Understanding current and future climate change impacts, and how best to respond, are major challenges for Australian communities. Decision-makers need to consider the range of potential impacts climate might have in the future, where and when these may occur and how different industries or parts of the community might respond. Such complex challenges are often labelled as 'wicked' and are best addressed using collaborative approaches involving shared learning across institutions.

This working paper described what 'adapting' to climate change means by clarifying commonly used terminology and how these different concepts are used in policy development in Australia, and other parts of the world.

Framing occurs when people with different knowledge, experiences and personal backgrounds consider an activity or a challenge. Framing is a way of making sense of a topic (like climate change) from an individual perspective but it can also be used to arrive at a shared meaning and sense of purpose in addressing the challenge.

The framing of adaptation can be **explicit** in strategies, policy documents, or procedural guidelines, but is often **implicit** in discussions, choices about planning approaches and processes, and the selection of assessment methodologies. Making framings explicit is important for establishing a collaborative process for adaptation. Explicit consideration of framing is also likely to influence the types of adaptation options and 'pathways' considered.

The most commonly used framings of adaptation are:

1. **A hazards approach.** 'Hazards' are closely linked to disaster risk management. This natural disasters frame has been a dominant consideration in policy discussion on climate change. Increasingly broader notions of climatic hazards are being adopted, linked with other socio-economic and environmental trends, for example population expansion into bushfire prone areas in South East Australia or coastal zones likely to be affected by sea level rise or storm surges.
2. **Risk management approach.** This is the dominant, organisational practice for dealing with many types of uncertainties in local government and the private sector. Central to the notion of risk are uncertainty and perception. Risk is defined as the combined product of hazards, exposure and vulnerability and there is a close connection between hazards and risk management approaches.
3. **Vulnerability approach.** This focuses on who or what will be affected and in what way. A wide range of possible policy responses to vulnerability are possible. For example, outcome vulnerability relates to the residual impacts (e.g. on a habitat, an ecosystem, or a municipality) after all feasible adaptation responses have been taken into account. A contextual framing of vulnerability considers vulnerability in the broader context of interactions between climate and society.
4. **Resilience approach.** The 'resilience' concept originated in ecology but is now being translated and applied to human systems. It is defined as the ability of groups or communities to cope with external stresses and disturbances as a result of social, political, or environmental change.

Each of these approaches has been influential in the development of climate change assessment methods. How assessment methods are framed is important given the role assessments play in adaptation planning in government. The framing can determine which departments are involved and which minister is considered to have responsibility for addressing climate impacts. Therefore, clarity of the framing and qualities and limitations of different assessment approaches will inform the methods used to assess impacts and adaptation responses.

The way that different people frame adaptation projects and planning processes is often implicit and may only come to the surface when arguing the business case for adaptation or when choosing a particular assessment approach.

Framing can occur at different stages of the adaptation process, for examples as an agency, local government, business or community considers the following questions:

'Adaptation to what?' What types of climatic changes do we need to adapt to?

'Who or what adapts?' Who or what are being impacted and how will it affect them?

'How do we adapt?' What are the processes and methods we use to devise and implement adaptation measures?

'What is good adaptation?' How do we know we are adapting successfully?

The choice of frame can lead to different types of climate change assessments:

Climate impact assessment. This approach is mainly concerned with analysing the effects of climatic change on natural, social and economic systems. Climate impact assessments can focus on biophysical impacts, socio-economic impacts, or both. Assessment can be conducted at various scales, from national level to regional and local impacts.

This approach uses quantitative data where available, leading to quantifiable estimates that are often sought after by policy and decision makers in order to justify pursuing particular strategies. However, uncertainty is a major problem because climate models are not able to give accurate local and regional scenarios for many climatic variables. The process of downscaling to regions and localities can also be resource intensive and time consuming.

Climate risk assessment. This is linked to the risk management approach and provides a way of dealing with uncertainty inherent in climate impact assessment. Risk can be quantified using various quantitative and qualitative techniques and used to assess the likelihood and expected consequences of a climate change impact under different scenarios, resulting in ratings of 'low', 'medium', 'high' or 'extreme' risk. This indicates the priority with which a risk should be treated. Risk assessment processes are suitable for organisations of various sizes, can fit well with existing organisational procedures and be readily integrated into existing risk management systems. However, the approach can lead government to be focused inwardly, often to the neglect of the interests of other departments or external stakeholders. Their reliance on qualitative data and expert knowledge also means that engaging with stakeholders from different backgrounds is essential.

Vulnerability assessment. This is now common practice in adaptation. It is implemented in many different ways using various definitions of vulnerability and a range of assessment methods. Vulnerability assessments typically address the characteristics of a vulnerable system, the type and number of stressors, and how these impact on the system. They can add valuable perspectives for adaptation and be used to build the case for adaptation based on local data and information, thus ensuring that adaptation options are designed in direct response to local needs and enhancing the potential for tangible local adaptation outcomes. The range of vulnerability assessment methods in use means it is difficult to compare the results from different assessments, or understand the spatial variability of vulnerability beyond the scope of the immediate analysis.

In summary, climate change adaptation can be considered a **process of continuous social and institutional learning, adjustment and transformation.** Understanding adaptation as an ongoing process of learning is particularly relevant for local and regional scale decision-making. Understanding local vulnerability and perceived risk using a combination of quantitative and qualitative data can provide a bottom-up perspective of adaptation needs that is specific to a particular location.

In a situation of constrained time and financial resources, the choice of a particular adaptation approach or a combination of approaches will be highly influential in establishing a particular dominant framing for an adaptation process. Ideally, policy developers and decision-makers should pause and query why a type of approach or method will be applied to any particular adaptation project and ascertain the relevance of the underlying concepts for the purposes of the activity.

About the project

This is the first working paper produced from the project: 'Framing multi-level and multi-actor adaptation responses in the Victorian context'. This is an 18 month project which aims to develop and test an operational framing of adaptation which will subsequently act as a decision-making 'roadmap' to better inform adaptation policy and practice by Victorian authorities at the local and regional levels. To achieve these aims, the project has been structured into four work packages:

1. the development of an overarching framework for adaptation (the 'roadmap');
2. preliminary economic analysis of climate change impacts and adaptation;
3. an exploration of local narratives; and
4. testing of these research outputs in three case study locations in Victoria.

This report on **Framing Climate Change Adaptation in Policy and Practice** draws from research carried out as part of work package one. It should be noted that the analysis discussed in the report covers the early stages of thinking about impacts and adaptation – the 'first step' on any adaptation pathway – rather than a comprehensive study of all adaptation processes. Other aspects of adaptation will be the focus of future project work.

For a copy of the full paper, visit: <http://www.vcccar.org.au/content/pages/framing-project>

Or contact: Dr Hartmut Fuenfgeld,
Research Fellow, Climate Change Adaptation Program (CCAP)
Global Cities Research Institute,
RMIT University, Melbourne, Australia
Email: hartmut.fuenfgeld@rmit.edu.au

Appendix 6: Participant evaluation of the think tank

Questions for Regional Business Development think tank evaluation: Returns 21/30

Questions	Tally
1. Which of the following best describes your affiliation? Government (Federal) Government (State) Government (Local) Industry University/other higher education Other please specify includes <i>Finance.</i> <i>Govt funded private company.</i> <i>CVSC.</i> <i>LLEN – partnership broker.</i> <i>NGO involved in mentoring & supporting small business.</i> <i>Industry Association.</i> <i>Community group & small business.</i>	x 2 x 3 x 2 x 4 x 3 x 7
2. Why did you attend the <i>Regional Business Development think tank</i>? To present To network To represent a workplace For personal interest Other, please specify <i>Learn</i> <i>Learn & explore what we can do.</i> <i>Add to my understanding to share with clients.</i> <i>Gain more knowledge on the subject matter.</i>	x 2 x 10 x 12 x 6
3. Did the <i>Regional Business Development think tank</i> improve your understanding of climate change adaptation? Strongly Disagree Disagree Neither Agree or Disagree Agree Strongly Agree Total	x1 (?) x 0 x 2 x 11 x 7 x21

<p>4. Were there any climate change impacts or issues for your region that you felt should have been included / given more attention by the <i>Regional Business Development think tank</i>?</p> <p>Yes</p> <p>No</p> <p><i>If 'yes', please specify.</i> <i>Education programs for general public</i> <i>More consideration of social issues.</i> <i>Involvement of Secondary Education Sector. Potentially Secondary & Primary schools hub of community activity.</i> <i>Systemic adaptation challenges impacting business but beyond sectors/industries.</i></p>	<p>x 4</p> <p>x 12</p>
<p>5. Were you introduced to any people, organisations or projects at the <i>Regional Business Development think tank</i> that may assist you to improve your / your organisation's response to climate change?</p> <p>Yes</p> <p>No</p> <p>Total</p>	<p>x 19</p> <p>x 0</p> <p>x 19</p>
<p>6. How would you rate the scope and relevance of the issues discussed at the <i>Regional Business Development think tank</i>?</p> <p>Very poor</p> <p>Poor</p> <p>Neither good or poor</p> <p>Good</p> <p>Excellent</p> <p>Total</p>	<p>x 0</p> <p>x 0</p> <p>x 0</p> <p>x 12</p> <p>x 9</p> <p>x 21</p>
<p>7. Which aspects of the <i>Regional Business Development think tank</i> did you find most useful?</p> <p><i>Coverage of industry and areas</i> <i>The case studies</i> <i>Industry stories</i> <i>The two case studies.</i> <i>Business stories.</i> <i>Industry adaptation – KRC Don, Solar City Presentation.</i> <i>Framing for Climate Change policy.</i> <i>Case studies.</i> <i>Solar City, Coliban Water, Don KRC programs and actions.</i> <i>Presentations/Discussions/networking.</i> <i>Learning what is happening in business/industry sector. Finding out who are the grass roots champions of change and finding out who are the connectors.</i> <i>The discussions and networking.</i> <i>All.</i> <i>Informal discussions.</i> <i>Insights into Industry business & Govt.</i></p>	

<p>8. Which aspects of the <i>Regional Business Development think tank</i> did you find least useful?</p> <p><i>Case study/group discussions – would have liked to target a more specific case study.</i> <i>Presentations a bit too long.</i></p>	x 2
<p>9. How would you rate the level of discussion and input from participants of the <i>Regional Business Development think tank</i></p> <p>Poor Undecided Fair Good Excellent</p> <p>Total</p> <p><i>John Martin is an excellent facilitator.</i></p>	<p>x 0 x 0 x 1 x 14 x 6</p> <p>x 21</p>
<p>10. How would you rate the level of opportunity that you had to contribute to the <i>Regional Business Development think tank</i>.</p> <p>Poor Undecided Fair Good Excellent</p> <p>Total</p>	<p>x 0 x 0 x 1 x 14 x 5</p> <p>x 20</p>
<p>11. Did you think the number and mix of participants and presenters was appropriate?</p> <p>Yes No</p> <p>Total</p> <p><i>Yes - but needed more diversity</i></p>	<p>x 19 x 1</p> <p>x 20</p>

<p>12. How could the <i>Regional Business Development think tank</i> have been improved?</p> <p><i>Form a network group who were present.</i> <i>More company representatives.</i> <i>Kept the presentations a bit shorter giving more.</i> <i>More attendees.</i></p>	
<p>13. Overall, how would you assess the value and importance of the <i>Regional Business Development think tank</i> as an event to discuss state and regional climate change adaptation issues and solutions?</p> <p>Very poor Poor Undecided Fair Good Excellent</p> <p>Total</p>	<p>x 0 x 0 x 0 x 3 x 13 x 5</p> <p>x 21</p>
<p>14. Do you have any other comments/suggestions regarding the <i>Regional Business Development think tank</i> that may assist with planning future VCCCAR events?</p> <p><i>1. Existing networks which may be handy to invite;</i> <i>EPA's Carbon Innovators (Link sustainability innovators).</i> <i>Local learning & Employment Networks (Links business/industry sector with education sector)</i></p> <p><i>2. Would like to see more discussion on actions to take at the end of the forum as a group.</i></p> <p><i>3. Very informative – Thank You.</i></p>	

