

Chapter 9

Energy

SUMMARY

Overview

Total energy demand is continuing to increase and there is now a summer peak in electricity consumption, due to the increase in farm irrigation. Demand for transport fuels, which are largely imported, remains high, as does demand from the residential sector. The energy sector is fragmented and there are many economic and regulatory barriers hindering development of an improved regional energy supply and demand system. Environment Canterbury has responded with a number of non-statutory (ie discretionary) projects to develop regional strategy for future energy requirements.

Resources

The Canterbury region is one of the fastest growing regions in the country and consumes around 12% of all New Zealand's total consumer energy. Energy from various sources and types is used to support business activities, development and the lifestyle of Canterbury people.

Overall, Canterbury is a net importer of energy, and is almost entirely dependent on importing to meet transport fuel requirements.

Primary energy (coal, gas, oil and stored water) and consumer energy (electricity) are supplied in independent markets but are tied to each other by the economic principle of marginal costs.

There are local regional and industry energy opportunities in areas such as consumer response, fuel substitution for heating, gas reticulation, prospecting for reserves off the Canterbury coast and the promotion of small-medium scale (distributed) generation. There are also opportunities for combined hydro and irrigation schemes, for waste-to-energy projects (with carbon credits) and local production of biofuels.

Processes

The biennial Canterbury regional energy survey identified an overall trend of increasing, rather than stabilising or decreasing, energy use. It also highlighted the region's dependence on oil products.

Increasing dependence on energy coincides with rising uncertainty about the future availability of some energy sources.

A large percentage of energy consumed comes from non-renewable resources, external to the region. The use of energy by key economic activities, including agriculture and food processing, is intensive. So too is energy use for individual and household use, such as heating, lighting and running computers and appliances. At the same time, the population is growing, households are becoming generally smaller and more energy intensive, and there is an increasing use of cars as a main mode of transport.

The impact of these changes is heightened by changes in land use, urban development and urban sprawl.

Outcomes

Peaks in electricity usage are now beginning to occur in the summer months as well as winter months, due mainly to farm irrigation practices.

Total energy consumption in Canterbury is increasing by approximately 2.5% per year, with demand growth for transport fuels increasing at an even higher rate – around 3% annually. Transport energy now accounts for around 55% of the region's energy consumption.

Response

Environment Canterbury is responding to these issues with a number of discretionary initiatives:

- Undertaking in 2005 and 2007 a series of regional energy forums, pinpointing the key issues
- Formation in 2006 of the Canterbury Regional Energy Forum to address key energy system priorities
- Promotion of demonstration projects around energy efficiency, sustainable use of energy and renewable energy

Key trends

The trend in demand growth for transport fuels is higher than the national average; and diesel consumption continues to grow at a faster rate than petrol. The regional industrial and commercial contribution to energy consumption continues to increase. Regional emissions continue to rise, and energy affordability issues are emerging, including household energy poverty.

Key indicators

- Rate of increase in usage of transport fuels and electricity
- Consumer prices for fuels (real)
- Energy consumption per capita
- Regional energy vs. non-energy sector greenhouse gas emissions
- Percent of household expenditure spent on energy (a measure of 'fuel poverty')

THE IMPORTANCE OF THE ENERGY RESOURCE

The prospect of doing without a reliable supply of energy for most day-to-day human activities is unimaginable. Energy is the life-blood of industry, commerce and agriculture. It enables people to heat their homes, travel freely, provide their food requirements, and communicate.

Energy is so pervasive that it is frequently taken for granted. It is also inherently connected with social institutions—the ‘soft’ infrastructure that helps bind the economy, society, and the environment. Energy is also connected to a whole range of activities, utilities and services including supplies use, mobility, transportation, and to a number of environmental impacts, including Canterbury’s winter air quality problems.

In Canterbury, the way in which energy is consumed and used in terms of resources and products is growing at an unsustainable rate. Gaining a better understanding of how and why people use energy is a key aspect of creating a sustainable, reliable, fairly priced and affordable energy system for Canterbury.

Table 9.1 outlines the environmental results which the region’s community is seeking for energy in Canterbury.



Table 9.1 Anticipated environmental results for the energy resource in Canterbury

Reference	Anticipated Environmental Outcomes
The Long Term Council Community Plan (LTCCP) 2006-2016	
Energy	<ul style="list-style-type: none"> • Environment, in general, is to be looked after • Partnering and advocating for energy efficiency with energy-related agencies
Regional Energy Strategy (2007)	
	<ul style="list-style-type: none"> • Moving towards a more sustainable energy system
The Regional Policy Statement	
Chapter 14.4 (1)	<ul style="list-style-type: none"> • More efficient use of energy
Chapter 13.4 (2)	<ul style="list-style-type: none"> • Provision of energy for the region’s and nation’s current and future needs from the most efficient and sustainable sources
Chapter 13.4 (3)	<ul style="list-style-type: none"> • Reduction in the adverse effects of energy production and use (including the effects on water resources, reduced carbon dioxide emissions and reduced air pollution)
Chapter 13.4 (4)	<ul style="list-style-type: none"> • Substitution of fossil fuels with more sustainable energy sources
Canterbury Regional Energy Strategy (CRES)	
	<ul style="list-style-type: none"> • Moving towards an affordable, reliable, secure and more sustainable energy system
Proposed Natural Resources Regional Plan - Chapter 3 (Air Quality)	
Policy AQL13	<ul style="list-style-type: none"> • Within the Christchurch Clean Air Zone 1 the Clean Air and Energy Efficiency Incentives programme is effective in ensuring fewer people live in inadequately heated homes

RESOURCES

International and national driving forces

Some discussion of international and national driving forces is required to place the regional energy issues in context. Major global challenges will force the development of a radically different energy system – globally, nationally and regionally – this century. In addition to environmental aspects and impacts, a different energy system will also force or require important changes to the way in which the future regional economy and our communities will operate and function.

Geo-political factors are intricately connected with energy, particularly maintaining and securing the supply of oil as worldwide demand continues to rise. Related closely to this is the challenge of peak oil – the approaching peak in global light crude oil production, which will lead to sustained rises in world oil prices (see Figure 9.1).

Arguably the era of cheap oil is over and it will be some 30 years before any replacement fuel can provide the types of service currently provided by oil products. All replacements, such as hydrogen-producing fuel cells, for example, are currently too expensive to introduce. In short, consumers will have to live with less available and more expensive oil.

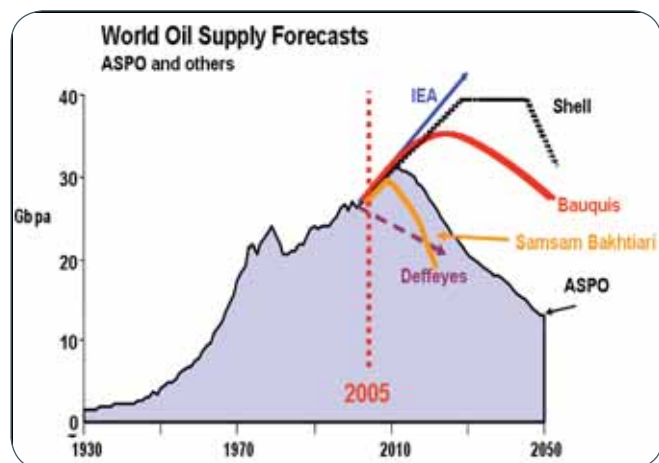


Figure 9.1 World oil supply forecasts (Source: Australian Association for the Study of Peak Oil and Gas)

There may also be, from time to time, physical shortages of oil due to factors such as a shortfall in worldwide refining capacity and the increasing demand for oil from developing nations, particularly China and India.

There is growing international consensus that human activity is a significant contribution to climate change. In addition to adapting to new ways of using energy resources, New Zealand society will also be required to adapt to climate change as the country has virtually no influence in the mitigation of global greenhouse gas emissions. The need to live with, and adapt to, altering regional climate patterns will undoubtedly present a number of challenges.

New Zealand (and Canterbury), like the rest of the world, still obtains most of its commercial energy from fossil fuels. But unlike many other economies, the New Zealand energy market is dominated by the natural gas market. Primary energy supply is around 750 petajoules per year (PJ/y) of which natural gas contributes close to 20%; however, consumer energy demand falls to 460 PJ/y, mainly through energy efficiencies in electricity distribution networks.

Natural gas demand was as high as 31% in 2002 but the major Maui field is now in decline and will play a limited role in providing national energy needs from around 2010. While transport energy also dominates the situation (51% of consumer demand, mainly from oil: see Figure 9.2), ongoing reliance on foreign oil (and potentially LNG to bridge the Maui 'gap') will place increasing pressure on both the national and regional energy sector.

Any move to generate electricity from LNG-fired power stations (requiring imported LNG) would for the first time in the country's history link electricity prices with an international fuel commodity, a situation the government would like to avoid. The government is seeking to address these kinds of issues by requiring that a high proportion (90%) of the country's electricity be derived from renewable sources by 2025 (MED, 2007a).

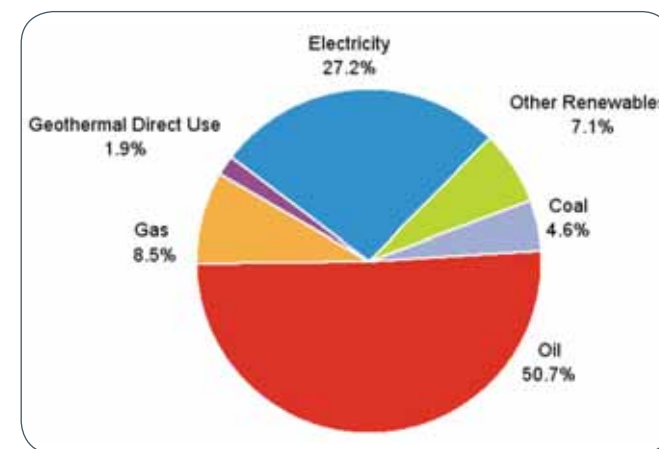


Figure 9.2 Total consumer energy for New Zealand by fuel for 2006 (Source: Energy Data File, June 2007, MED. Data excludes co-generation; 'other renewables' includes direct use of bio-gas, wood and solar)

Canterbury region

Of current energy supply, the Canterbury region can at best be described as 'selectively endowed'. The region produces some 28% of New Zealand's electricity supply; from the Waitaki, Aviemore, Benmore, Ohau and Tekapo stations in the Waitaki system. Around 50% of the net production is consumed within the region, with the remaining 50% being exported to the North Island. Smaller schemes also produce electricity from the Rakaia and Rangitata catchments.

Canterbury is dependent on electricity for core energy requirements, and dependent on transmission. Electricity comprises approximately 25% of the overall regional energy consumption.

Additionally, the region does not have any terrestrial hydrocarbon production aside from a small coalmine. All liquid fuels, gas and coal consumption, together comprising around 70% of total energy consumption, are imported, either from other regions within New Zealand or (originally) from overseas. Oil products accounted for 62% of energy consumption in 2006 (see Figure 9.3).

The effects of climate change are also expected to become more pronounced. Canterbury is predicted to experience more droughts as the 21st century progresses (O'Donnell, 2007). There are implications for the Canterbury region, such as the management of summer peak electricity demand for energy-intensive irrigation (See Figure 9.4).

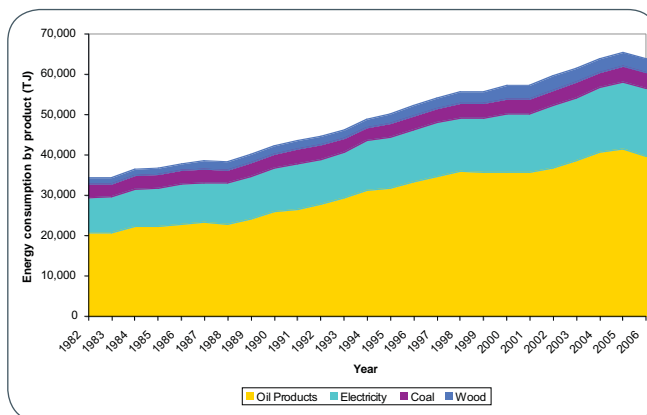


Figure 9.3 Canterbury region energy consumption by fuel type 1982-2006 (CAENZ, 2008)

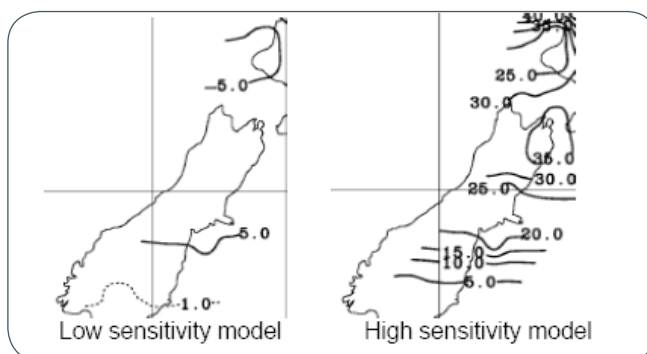
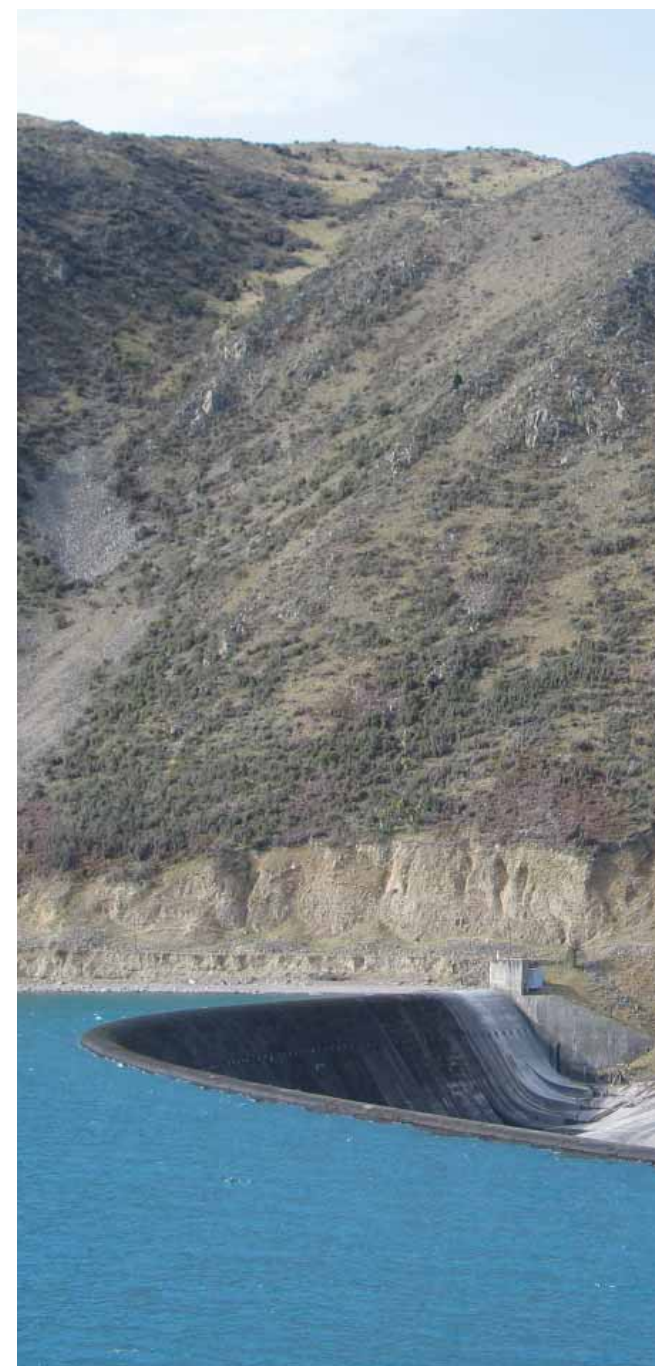


Figure 9.4 Projected increase in the number of hot days (>25°C) to 2100 (Mullan et al., 2001, cited in O'Donnell, 2007)



PROCESSES

Canterbury is the second-fastest growing region in the country, placing pressure on existing energy infrastructure, especially the transmission network, and stimulating demand for new infrastructure. The region uses approximately 12% of the nation's consumer energy.

The Canterbury region faces some tough energy choices in the future. Survey and trend data show the Canterbury community is, by and large, using increasing amounts of energy. It is also becoming clear that energy and planning for future energy infrastructure has become both a national and a local issue.

Factors such as the electricity industry reforms of the last decade, a growing reliance across the community on high quality energy services and, increasingly, climate change and other environmental issues are bringing a greater immediacy to thinking about how, at a local level, the Canterbury region is going to meet the future energy needs of its communities.

This shift in focus is occurring at the same time as policy emphasis shifts towards sustainable development and associated actions; of which a vital component is addressing energy security and supply and demand issues within the framework of creating for the country and its regions, a sustainable energy system.

Climate change and peak oil impacts are projected to have an effect on council services and operations during the term of the 2006-16 LTCCP (Bradshaw et al., 2007). Fuel shortages are expected to occur within this planning period. These predicted shortages, resulting in sustained rises in world oil prices from the peaking (or plateau) of world oil production, will very likely have a direct impact on Environment Canterbury's ability to deliver its services and carry out its operations.

This impact is expected to be the greatest in the public passenger transport and regional land transport portfolios. Levels of service within the hazards portfolio are expected to be affected by an increased number of disruptive extreme weather events.

Energy and electricity systems are highly complex and interconnect with many aspects of a modern society (see Figure 9.5). It is worth briefly reflecting upon the interdependencies that govern energy and other infrastructure resilience and the region's capacity to cope with a major disruptive event – illustrative of a secure and reliable electricity supply.

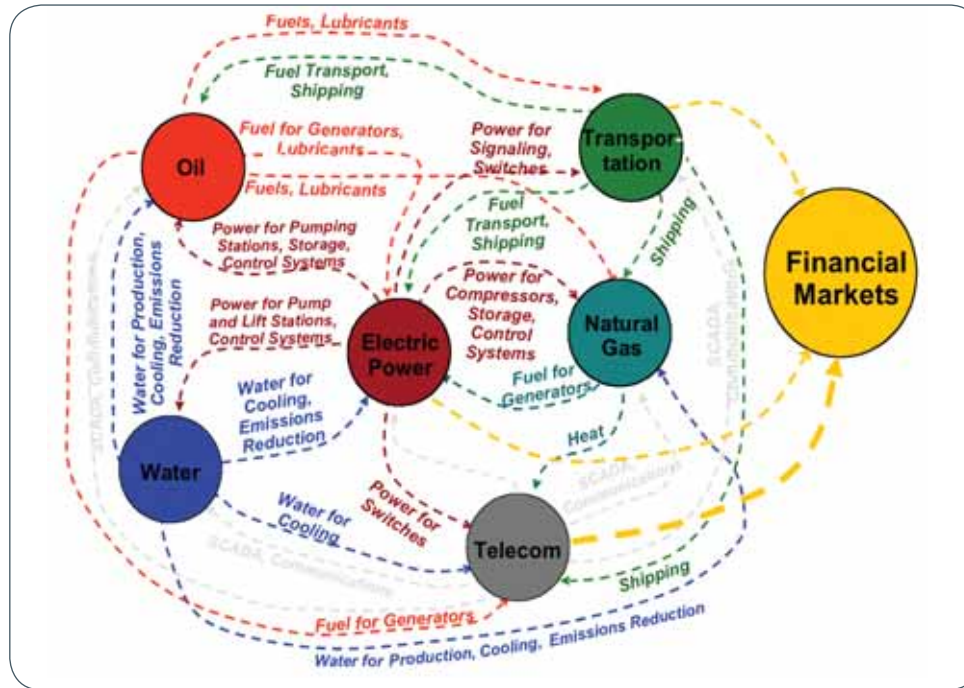


Figure 9.5 Inter-relationship between electricity system and other built environment services (image courtesy of CAENZ, and Professor Tom O'Rourke, Cornell University)

Common examples of such dependency, often overlooked, include:

- Pellet fires that require electricity to operate
- Gas hot water systems that require electricity for control operations
- Communication systems that require mains supply to recharge
- Water supplies, fuel supplies, control systems and signalling, transport and a myriad of other applications reliant on electricity

The security issues surrounding electricity supplies were ably demonstrated by the heavy snowfall in South Canterbury in June 2006, when some isolated communities were without adequate energy services for up to three weeks. In a further example, the intrusion of water into the mains gas network in the business district of Wellington in December 2006 was seen to cause untimely and costly disruptions to commercial activity.

These kinds of events have served to heighten security concerns and start communities thinking about distributed or local generation (DG) which is much less dependent on the major generation sources; or 'off-grid' micro-scale combined heat and power systems (eg WhisperGen) to counter similar future occurrences.

The greatest challenges to mitigation of greenhouse gas (GHG) emissions pertain to petrol and diesel consumption in the transport sector. However, the wider picture also indicates that Canterbury, and the South Island in general, is becoming increasingly reliant on electricity deliveries from North Island thermal generation, with an associated increase in greenhouse gas emissions when the flow is southward. This occasional southward shift simply reflects the dry year risk to South Island generation.

OUTCOMES

The state of the environment with respect to energy is the measured trends that reflect a range of direct and indirect outcomes.

Biennial regional energy survey

Environment Canterbury produces a survey of regional energy trends going back to 1982 with the most recent survey providing an analysis of data for the 2005 and 2006 years.

The total energy consumed in Canterbury has just about doubled since 1982 with the biggest increases being in oil product consumption.

Survey data highlight the importance of oil products (over 60% share), almost all of which is consumed in the transport sector (see Figure 9.6). The results presented in all regional energy surveys prior to the 2005-2006 survey illustrated an overall trend of increasing regional energy use and a dependence on imported oil products.

Selected survey data for the recent 2005-2006 survey (CAENZ, 2008) includes:

- The majority of energy consumed in Canterbury comes from fossil fuels, contributing 68% of total energy
- A higher level of electricity consumption than the national average substantially compensates for the non-availability of reticulated natural gas in the South Island
- Total energy consumption in the Canterbury region has remained relatively stable recently, declining over the 2004-2006 period by 0.1% per annum
- Electricity consumption increased at 2.4% per annum
- Transport sector energy consumption is 35% higher in Canterbury than the national average
- Diesel is now the main type of vehicle transport fuel (on an energy, not volume, basis) (see Figure 9.7)

While the latest survey shows a noticeable decline for the first time in the use of oil products, there is a discernable longer-term trend of increasing, rather than stabilising or decreasing, regional energy use. It is as yet uncertain whether this decline represents a stabilisation in regional energy use, in response to increasing cost and uncertainty over oil supplies, or a short-term effect.

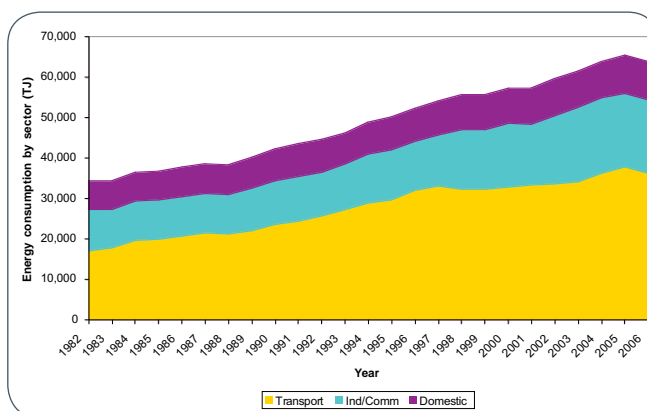


Figure 9.6 Canterbury region energy consumption by sector

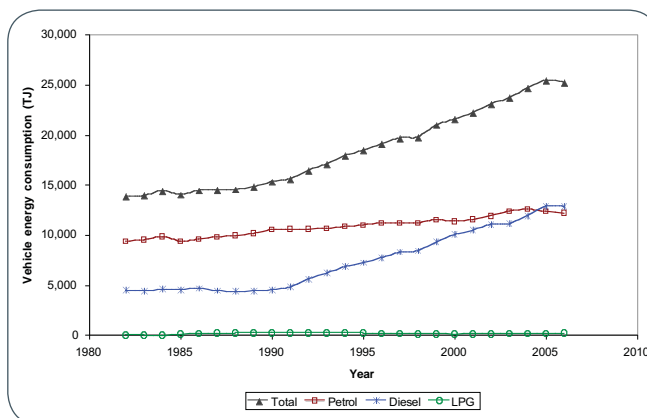


Figure 9.7 Canterbury region vehicle transportation energy consumption by product



Economic activity

Canterbury, like the rest of New Zealand, faces a number of major issues, including total energy demand rising at around 3% per annum and growing constraints in the electricity transmission network. Higher than the national average population growth is also expected to put pressure on the existing energy infrastructure.

While Canterbury is not a major hub of industrial activity compared to other regions, energy use in the commercial and industrial sectors is still significant. Tourism, intensive agricultural activity and significant food processing and related industry characterise industrial/commercial energy use within the region.

Figure 9.8 suggests that the Canterbury region has:

- A high reliance on various manufacturing sectors, relative to the national economy
- A relatively high dependence on faster growing sectors (eg food, beverage, trade, tourism and other services)
- An under-representation, relative to the New Zealand economy, in the business services, agriculture, natural resources and government sectors, which apart from business services, are all relatively slow growing sectors at the national level.

The Canterbury region is thus a vital contributor to the South Island economy. Energy vulnerabilities within Canterbury, such as a loss of transmission, potentially have significant flow-on effects to the rest of the domestic and national economy.

Canterbury has limited new electricity generation potential, limited other regional energy production opportunities and a significant dependency on electricity for its core energy requirements – which create economic vulnerability. An indication of this vulnerability is given by Figure 9.9 which tracks energy prices in the commercial sector over recent years. The largest increases have been in petrol and diesel although all commodities have had significant price rises recently.

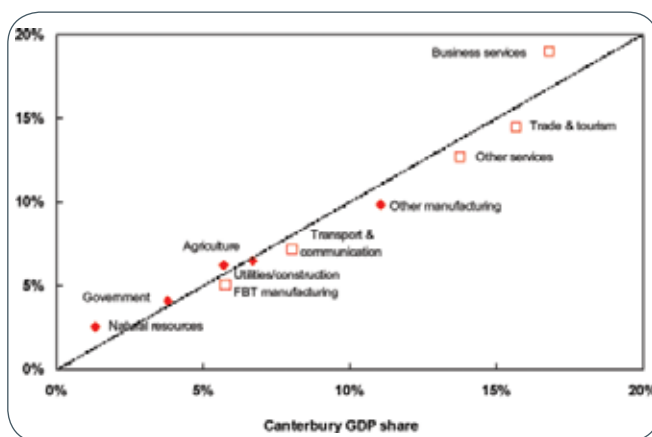


Figure 9.8 Canterbury's industrial profile (NZIER, 2006)

Note: Plots to the right of the line are industries more important to Canterbury than to New Zealand as whole, red squares are industries, fast-growing nationally, diamond plots are industries slow-growing nationally.

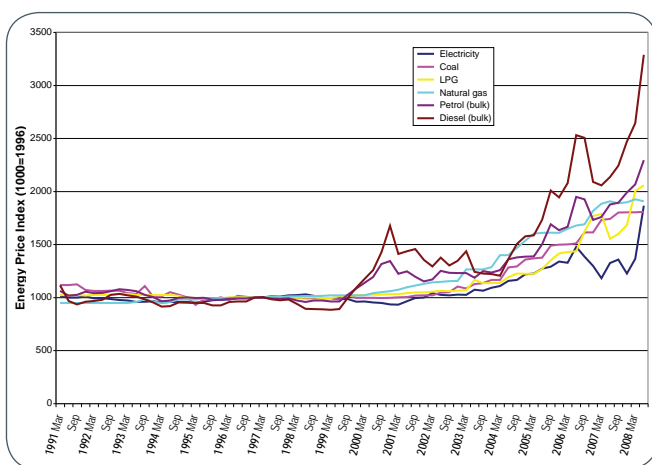


Figure 9.9 Energy Prices: six monthly, March and September 1991-2008, Commercial Sector (Statistics NZ, cited in CAENZ, 2007)



Air quality and energy relationship

Environment Canterbury's Clean Heat Project has achieved great success in helping to clean up the Christchurch air sheds (see Figure 9.10) by allowing for the conversion of energy-inefficient open fires and log burners to cleaner forms of heating. There are, however, ongoing concerns around finding a balance between the uptake of energy efficient heat pumps and the use of efficient solid fuel appliances (Gaudin and O'Connell, 2007).



Figure 9.10 Typical high wintertime pollution event experienced in a Canterbury settlement

A shift to include more electricity, oil and gas in the appliance mix also raises questions regarding regional energy security and efforts to mitigate GHG emissions. While the efficiency of heat pumps is undoubted, they are replacing a solid fuel source, which means increased electricity demand placing an increased loading on lines company networks. Additionally, there is anecdotal evidence of heat pumps being used in summer as air conditioners and the compensatory effect of household occupants installing more than one heat pump, negating efficiency gains.

There is also growing evidence that recent considerable price increases for transport fuels combined with increased electricity pricing, tougher building code requirements and tougher environmental standards (NESAQ) for home heating emissions, in particular, have resulted in an increasing proportion of the community experiencing 'fuel poverty'.

A move toward a cleaner energy future could well exacerbate this disparity with the NESAQ driving a higher standard in wood drying and forcing a shift to a more formal market (including wood pellet) and a greater reliance on fewer distribution channels. This situation would have a flow-on effect on fuel choices for both new build and renovation industries with the continued likelihood of continued fuel switching to either electricity or LPG.

Figure 9.11 indicates the cost of electricity across sectors nationally since 1979.

Water and energy relationship

The last 20 years have seen as much as a four fold increase in the use of water for agricultural irrigation. Much of the increased use is in the form of groundwater rather than surface water for irrigation. Recent data indicate that nationally the Canterbury region accounts for 58% of water allocations by volume; irrigation accounts for more than 80% of consent allocations (MfE, 2006a).

The demand for water has been driven mainly by dairy farm conversions. Electricity demand for irrigation is virtually all for pumping water from aquifers. Water demand is both highly location-specific and seasonal. Anecdotally, summer rural electricity usage in some Canterbury locations is on par with that used in a city the size of Invercargill.

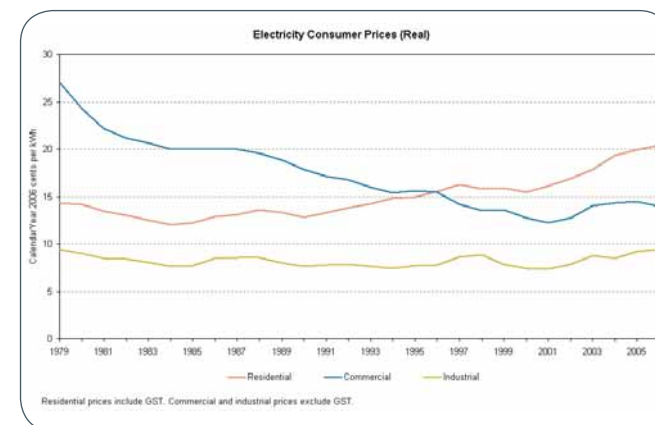


Figure 9.11 Consumer price (real) rises for electricity (MED, 2007b)

RESPONSE

The organisational responses taken to resolve the issues identified in this chapter, and to achieve the results the community seeks for the resource, take a number of forms.

These include:

- the development and implementation of a strategic planning framework for energy management (stakeholder partnerships)
- investigations to improve understanding of the resource and trends in its usage
- targeting key action areas for 'early runs on the board'
- advocacy and incentive programmes to encourage behavioural change

Central government

In 2007, central government acknowledged the need to respond to energy and climate issues through its energy and climate strategies (MED, 2007a; EECA, 2007; MfE, 2007).

Paramount, is addressing energy security and supply demand issues within the framework of creating a sustainable low carbon emissions energy system that takes into account affordability, fair pricing and secure supply. An emissions trading scheme is being designed to

allow businesses and households to make decisions that are good for the environment, and discourage actions or activities that generate greenhouse gas emissions.

The government has stated the desire for closer engagement and partnership with local government. Government has also flagged support for development of regional and local energy strategies.

Amendments to the Resource Management Act in 2005 also provide Environment Canterbury with a mandate to plan for the region's future renewable energy infrastructure requirements.

Additionally, the Local Government Act 2002 requires local government to show (through Long Term Council Community Plans) how its activities contribute to community outcomes and encourages partnerships of the public sector with both community interests and the private sector to achieve these outcomes. The development of these plans enables local government to add a proactive strategic role in achieving a sustainable regional energy system and through these plans to put in place supporting policy which will facilitate energy investment, particularly distributed generation and demand-side management.

Regional government

Policy mechanisms such as the Regional Policy Statement (Kissell, 2008) assist in giving weight to regional energy strategies.

Concerted action on a regional stakeholder approach is underway. A series of interactive workshops (Energy into the Future) held in Canterbury in 2005, and reprised in 2007, brought major energy users, suppliers, and solution providers together to identify issues for Canterbury and to debate ways forward.

Key themes of a regional approach identified at these forums are:

1. How we can make better use of energy
2. The role of energy innovation
3. How the uptake of sustainable forms of energy can be best promoted
4. How better care of the environment can be taken
5. The contribution Canterbury can make to an efficient and affordable energy system for the country.

Broad responses being considered by stakeholder groupings include:

- Provision of sustainable, secure, affordable and fairly-priced electricity system
- Enabling a transportation system:
 - which encourages fleet-wide vehicle efficiency
 - where private transport is used more strategically
 - using increasing amounts of biofuel or biodiesel additives to reduce reliance on imported fuels
- Energy efficiency and conservation – driving increased benefits from using less, or not using, energy respectively, eg:
 - redesigning industrial processes and electrical appliances to use less electricity
 - smart building design (passive solar design to reduce need for space heating and water heating fuels)
- Fuel switching, eg:
 - using forest by-products to generate heat and power in the wood processing industry instead of consuming electricity
 - better matching of fuel type with desired energy service (with potential co-benefits for other resources, eg ambient air).



The Canterbury Regional Energy Forum (CREF) is one such stakeholder grouping formed to address energy security issues. It includes regulatory, energy sector and commercial partners and its major body of work to date is the Canterbury Regional Energy Strategy Project (CRESP) (CAENZ, 2007).

The aim of this forum is to achieve for the Canterbury community a secure supply of reliable and affordable energy, the basis of which will be development of the Canterbury Regional Energy Strategy (which would have the statutory backing of the Regional Policy Statement).

Preliminary activity by CREF has identified a broad range of energy issues of particular importance in Canterbury. These issues include growth in energy demand, constraints on electricity transmission into the region, the need to articulate better distributed and local generation opportunities, regional winter electricity supply risk, deterioration of air quality at times, competition for water, and the limited reticulation of gas. Work has also been undertaken on the non-grid energy system (CAENZ, 2006).

Further analysis on specific regional, local and industry-related aspects is proposed: regional initiatives include the environmental considerations around potential energy developments; local opportunities include combined hydro-irrigation schemes, waste-to-energy projects and wind power; industry-related considerations include demand management and risk pricing strategies (eg using smart metering).

The key to the success of this regional energy approach is developing a high consumer responsiveness to the risks and vulnerabilities that characterise a modern energy system. Environment Canterbury is also developing mechanisms for support of energy demand reduction projects and practical community measures.

Community

Environment Canterbury is a participant in the Communities for Climate Protection (CCP®) programme (CCP-NZ, 2008), a voluntary programme which aims to empower local government to reduce greenhouse gas emissions from both internal operations and from Canterbury communities through a strategic five-milestone framework.

Environment Canterbury is also supportive of grass-roots approaches. Community energy groups such as Community Energy Action undertake retrofitting of energy efficiency measures.

Community groups in the region such as Port Lyttelton and Lincoln EnviroTown are adopting energy self-sufficiency and wider sustainability responses in large part due to their respective community's desire to address at a local level issues such as energy efficiency, climate change and peak oil.

The Transition Town (TTANZ, 2008) and Carbon Reduction Action Groups (CRAGs, 2008) also offer useful, broadly similar, models to reduce greenhouse gas emissions and aim for lower energy or low carbon lifestyles.

Planning, regulatory, and educational responses to energy issues in the region are summarised in Table 9.2.



Table 9.2 Responses to pressures on energy

Issue	Investigations & Monitoring	Policy & Planning	Advocating & Education
Sustainable energy resources	Identification of region's resources	Canterbury Regional Energy Strategy - develop with stakeholders a Regional Statement of Opportunities as a basis for future planning - benefits derived from renewable energy	
Increase in energy demand	Biennial regional energy survey	Canterbury Regional Energy Strategy - eight priority areas for action including existing homes, electricity transmission and biofuels/biomass	
Dependency on imported transport fuels	Investigation reports	Long-Term Council Community Plan - develop a policy response to projected future fuel price increases and shortages	
Lack of effective regional energy planning framework		Canterbury Regional Energy Strategy - develop with stakeholders a Regional Statement of Opportunities as a basis for future planning	Community consultation
Transmission constraints		Regional Policy Statement - encourage a reliable and resilient national electricity network	
Limited local generation opportunities		Regional Policy Statement - encourage efficient, reliable and resilient electricity within Canterbury	
Regional winter electricity security		Regional Policy Statement - develop with stakeholders a Regional Statement of Opportunities as a basis for future planning	
Conflict with water and air quality planning	Monitoring of summertime electricity use and space heating end use	Natural Resources Regional Plan - review PNRRP Chapters 3 and 5 to identify potential for energy conflicts	
Development of energy infrastructure	Monitoring for environmental and social effects	Regional Policy Statement - integration of infrastructure with land use	
Energy efficiency		Regional Policy Statement - efficiency of end use of energy	Advocate for and encourage best practice
Public awareness and consumer responsiveness		Long-Term Council Community Plan	Publicity material

