

# **1. Energy Resources and Infrastructure**

## **1.0 Introduction**

- 1.0.1 In New Zealand, energy resources and infrastructure consist of electricity production; transmission through the electricity grid; domestic and industrial energy use; and oil products for transport use. The country relies on primary energy from oil, water, wood, natural gas, coal and geothermal energy to supply its energy needs, while in Southland oil (for transport) and water (hydro electricity) dominate.
- 1.0.2 Half of New Zealand's energy needs are supplied by imported fuel oils, used predominantly on the road transport network. New Zealand's energy prices have historically been low by international standards, and there has been little meaningful investment in energy efficiency throughout our energy system.
- 1.0.3 Some traditional energy sources are beginning to struggle to meet growing energy demand securely. We are increasingly vulnerable to oil supply disruptions (primarily as a result of international events beyond New Zealand's control, because of our reliance on imported oil for transport). Various commentators also argue that the worldwide production of oil has peaked, or will do soon, and as a result New Zealand needs to seek opportunities for oil supply within its own domestic borders or within its 200 mile economic zone. Climatic variations also result in hydro generation being below required levels from time to time as a result of dry years and water shortages. There is also the additional challenge of reducing greenhouse gas emissions from fossil fuels to meet international climate change obligations. Within Southland, the capacity of electricity transmission lines is also a concern. The expansion of dairying, for example, has increased rural electricity demand significantly in recent years, and the ability to adequately supply any new industry which is a high electricity user is now curtailed.
- 1.0.4 Current and potential energy resources within Southland include fossil fuels, water, wood, wind, solar, tidal and wave. Some of these are renewable and this enables continuation of supply without depleting the source. Others, like Southland's coal and lignite resources which are non-renewable, have significant potential for future development. While the RMA does not require their use to be managed in a sustainable manner, it does require the effects of their extraction to be managed sustainably.
- 1.0.5 Roading, airports, ports, telecommunication facilities, the rail network, power generation sites and other network utilities (including water, sewerage and electricity transmission and distribution) make up the infrastructure of an area. This infrastructure forms part of national or regional networks and enables communities to provide for their social, economic, and cultural wellbeing and their health and safety.
- 1.0.6 Security of supply, price rises and the environmental consequences of using fossil fuels as energy sources are all highlighted as issues in the Regional Policy

Statement. There is considerable guidance from Central Government on energy issues; however, these tend to focus on large scale issues and effects and it is important that the Regional Policy Statement provides a regional framework for sustainable energy management and that this is reflected in the provisions of the Southland District Plan.

- 1.0.7 The Kyoto Protocol was adopted in Kyoto, Japan, on 11 December 1997 and came into force on 16 February 2005. This is an international agreement linked to the United Nations Framework Convention on Climate Change. The major feature of the Protocol is that it sets binding targets for 37 industrialised countries and the European community for reducing greenhouse gas emissions of carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulphur hexafluoride (SF<sub>6</sub>). These targets average five per cent against 1990 levels over the period 2008-2012. By 2012 a new international framework needs to have been negotiated and ratified which can deliver on new emission reduction targets.
- 1.0.8 Different countries have different targets. New Zealand's target is to reduce its greenhouse gas emissions to the level they were in 1990, notwithstanding that greenhouse gas emissions in 2005 were about 25 per cent higher than they were in 1990. New Zealand is required to take responsibility for any excess emissions above its 1990 target, such as purchasing emission units on the international market or using forest sink credits.

## **2. Relevance of existing Regional Policy Statement and Existing Southland District Plan Issues**

- 2.1 One of the purposes of this paper is to assess whether the existing issues relating to Energy Resources contained in the Regional Policy Statement are still relevant to the management of Energy resources in Southland, and whether the objectives and policies that are presently contained in the Regional Policy Statement address those issues appropriately.
- 2.2 There are eleven issues contained in the existing Regional Policy Statement with respect to Energy Resources in Southland. In summary the issues are:
- the global effects of the emission of greenhouse gases and associated environmental and public health effects;
  - the potential for effects on the environment of the use, development, production and transportation of energy resources;
  - energy resources are generally finite in their extent and regard needs to be given to their efficient use and sustainable management, and investigation undertaken into the development of more efficient and alternative energy technologies;
  - past practices, for example strip mining, water abstraction or channelization, have put vulnerable ecosystems at risk;

- concern that energy is being lost or wastefully used, due to energy efficiency and conservation measures not being given enough importance and emphasis;
- energy use and production practices in the past have not considered the resulting impact on Maori cultural and traditional spiritual values;
- the national importance of hydro-electric power generation in Southland needs to be given better recognition in the region;
- potential adverse impacts of nuclear power;
- Southland's lignite resources are of national significance;
- there is insufficient knowledge and documentation about the location and extent of mineral and energy resources in the Region;
- development of areas where mineral and energy resources are located can adversely affect the ability to access and use those resources.

2.3 We've reviewed each of the issues to assess whether they remain relevant in Southland today. What we've found is that most of the existing energy and infrastructure issues within the current Regional Policy Statement remain relevant. However, some of the issues have changed in importance or their scope may have changed slightly, requiring some corresponding changes in the wording of some of the listed issues. Several can now be amalgamated to create issues that have a wider scope.

2.4 The RPS presently focuses on the sustainable management of energy resources used within the region, while expressing concern at the high rate of dependence regionally and nationally on non-sustainable energy sources and consequentially promoting use of renewable energy resources. The RPS also acknowledges and promotes management of the adverse effects of energy production and use, including impacts on Maori cultural and traditional values. We have also undertaken a detailed analysis of each objective, policy and method that relates to each issue to check that they are all still relevant. This analysis has shown that the basic framework remains relevant, with some amendments necessary in order to help define the extent and scope of each of the issues.

2.5 The RPS adopts a range of public awareness, promotional and advocacy methods to achieve the objectives and policies, as well as recognising the role of regional and district plans and the resource consent processes.

2.6 The current Outcomes anticipated by the RPS are:

- Outcome 14.1 Efficient and sustainable use of energy resources
- Outcome 14.2 Decreased dependency on energy from non-renewable sources
- Outcome 14.3 Development and application of a national energy strategy
- Outcome 14.4 Increase in the stock of energy-efficient buildings
- Outcome 14.5 Reduction of the impact of energy production and use on Maori cultural and spiritual values

- Outcome 14.6 Reduced adverse effects on the environment from the development, production, use and transportation of energy
- Outcome 14.7 Exclusion of nuclear power production from Southland

2.7 The issues relevant to Energy and Infrastructure contained within the existing Southland District Plan are:

- the need to reduce the emission of greenhouse gases in accordance with the objectives of The Convention on Climate Change;
- energy waste, and the inefficient use and production of energy;
- the potential for the development of energy resources within the Southland District.;
- the environmental effects of energy production and use;
- mineral resources are important to the region's future, and their integrated management should be provided for as part of resource management for the District;
- development and utilisation of mineral resources should be managed to ensure that negative environmental impacts are avoided, remedied and mitigated;
- the development and continued maintenance of public works and network utilities are an important component in providing for the social, economic, cultural well-being and health and safety of the people of the District;
- the construction and operation of public works and utility networks can have a significant environmental effect, particularly in terms of visual impact.

2.8 The Energy and Infrastructure issues outlined above have been reviewed and are considered to still be relevant. However there are a number of additional issues that need to be identified and addressed in the second generation Southland District Plan.

### **3. Emerging Issues Requiring Consideration**

3.1 Since the Regional Policy Statement and Southland District Plan became operative, several issues have arisen with respect to energy and infrastructure at the national, regional and local level.

#### **3.2 National and Regional Issues**

3.2.1 Amendments to Section 7 of the Resource Management Act 1991 (RMA) have raised the profile and importance of sustainable energy management.

3.2.2 The RMA now identifies end use efficiency, the benefits to be derived from the use and development of renewable energy and the effects of climate change as matters to which "particular regard" shall be had. Together, these changes have given a clearer mandate to tackle energy (and climate change) issues. Central Government has come out with policy that sets out to address this issue, for

example the New Zealand Energy Efficiency and Conservation Strategy. However, there has been little directive to local authorities as to how they should deal with the problem of end use efficiency.

- 3.2.3 A National Policy Statement (“NPS”) on Electricity Transmission is now in force. It seeks to ensure the efficient and secure supply of electricity by recognising electricity as a matter of national significance, and by elevating the status of electricity transmission under the RMA.
- 3.2.4 Matters contained in the NPS are:
- managing the adverse effects of third parties on the transmission network;
  - managing the environmental effects of transmission;
  - recognition of the national benefits of transmission.
- 3.2.5 New Zealand has based its transportation sector on cheap imported fossil fuels; however, recently there has been considerable debate about the future of the international fossil fuel sector. There may soon be a need to move away from reliance on international sources of fuel and diversify the sources of energy for transport.
- 3.2.6 “Peak Oil” is the term used to describe the point when worldwide production of conventional (cheap) crude oil peaks in volume. After it peaks, more expensive and non-conventional sources of oil will be needed to meet demand.
- 3.2.7 Arguably the single biggest energy issue today is the global effects of the emission of greenhouse gases, their associated environmental effects and their potential ability to change the earth’s natural fluctuations in climate – i.e climate change.
- 3.2.8 The Kyoto Protocol aims to reduce greenhouse gases that cause climate change. New Zealand’s target is to reduce emissions to 1990 levels, or take responsibility for excess emissions.
- 3.2.9 The length of time it takes to obtain RMA approval for new development is perceived as a problem, particularly for major projects and in providing upgrades to energy infrastructure. This is especially true for applications under the RMA that involve new technology as there is no established framework around which decisions can be based.
- 3.2.10 Whatever the source of new energy, infrastructure will be required to provide for its conveyance. This includes electricity transmission lines and regional network lines, and some of these are not of a standard that will enable sustained growth within the Southland region in the future. The current Southland transmission constraint affects the ability of industry to obtain guaranteed electricity supply (currently on an infrequent basis). The constraint would occur more often if a new major (100-150MW) energy user were to set up in Southland. It is likely that the cumulative effect of dairy conversions in Southland is increasing electricity demand

faster than the ability of electricity producers to supply. This is also compounded by the fact that dairy farms and dairy processing factories use a great deal of electricity during the summer, causing major problems for energy distributors as there are now very small windows of opportunity to maintain and upgrade lines. The concerns regarding electricity supply in the region are compounded by uncertainty over Transpower's future upgrade plans.

- 3.2.11 With rising electricity costs, continued future uncertainty of electricity supply and improvements in micro generation technology, there is a chance that off-grid systems will become more affordable in the future.

#### **4. Options for addressing issues**

- 4.1 This section identifies potential options for addressing issues identified in section 3 of this paper, builds on some of the points raised by Southland District Council and includes additional comments about energy resources.

- 4.2 Historically, readily available and relatively affordable energy has driven our economic growth. For the future, New Zealand faces choices on the nature of the economy and how it meets the associated energy demands. An overriding consideration is how we can achieve sustainability, balancing affordability, security and environmental protection. Given the importance of energy resources to all parts of our economy and everyday life, it is imperative to ensure that Southland has security of supply of all necessary energy in all its various forms.

#### **4.3 Energy Strategies**

- 4.3.1 The National Energy Strategy to 2050 'Powering Our Future' sets out the previous Labour-led Government's vision of the NZ energy system. Although it is unclear where the current National-led Government sits with this strategy it would be prudent to take this strategy into consideration during this discussion. In addition, regional and local policy development will have to take account of the recent amendments to the RMA concerning the issues of climate change and greenhouse gas emissions and the benefits associated with the use and development of renewable energy.

- 4.3.2 The Waikato region has taken planning for energy resources one step further than this by producing a Regional Energy Strategy.

- 4.3.3 Should Southland consider the adoption of a regional energy strategy? Is there a desire among Southland communities to adopt such a strategy and if so, which role should territorial authorities and/or Environment Southland adopt?

#### **4.4 Leadership/co-ordination**

- 4.4.1 Is a regional coordination role desirable, drawing together initiatives and resources that would benefit from joint action? These could include developing relationships

with the energy sector to advance the aims of the region, contribution to government policy and ensuring the integration of energy issues into other initiatives within Southland.

- 4.4.2 This role could also involve the development of energy policy on a regional basis. Such policy or strategy could be issue driven (such as security of supply) or outcome based (such as increased energy efficiency or investigation and development of particular energy resources). The preparation of a Regional Energy Strategy could also provide a coordinated and agreed regional framework for implementing the national energy directives of the government and the policy framework of the Regional Policy Statement, removing the need for individual Councils to do the same.

#### 4.5 **Information provider/educator**

- 4.5.1 Do Councils wish to adopt a role of providing information and education on energy matters as a means of addressing energy issues? This could include, for example, focusing on public education or the provision of market information to generate new initiatives (such as research and development supporting renewable forms of energy or energy efficiency measures). There may be scope for the Southland District Council and the Environment Southland to take a more active role in facilitating energy initiatives throughout Southland, similar to the renewable energy trial Southland District Council is involved with on Stewart Island.

#### 4.6 **Planning/regulator**

- 4.6.1 Councils are already regulators through regional plans, district plans and the RPS. However, should the RMA framework be used to deliver energy outcomes? (for example, implementing requirements for energy efficiency, and facilitating the use of energy-efficient technologies)

#### 4.7 **Funder (of services and infrastructure)**

- 4.7.1 Certain energy issues can be addressed through the application of funding. This funding could be direct investment in infrastructure to advance projects, to subsidise access or provide resources to assist with energy programmes (such as the provision of resources to other agencies to implement energy strategies).

#### 4.8 **Asset Owner**

- 4.8.1 Investment could be tailored towards ownership or part ownership of assets directed towards energy outcomes of strategic importance to the region. That could include the ownership of land containing energy resources or the ownership of land suitable for the establishment of industrial processes developing those resources.

#### 4.9 **Advocacy**

- 4.9.1 Given the obvious current constraints that Southland has with transmission of electricity, regard needs to be given to promoting and advocating the region's needs to Central Government, Transpower and the Electricity Commission - both to "import and export" energy from Southland to provide security of supply to regional industry, commerce, domestic and rural users and to allow Southland to export electricity produced locally.

#### 4.10 **Research and Development**

- 4.10.1 It may also be desirable to investigate and promote alternative means of supply, such as micro-generation of electricity within Southland. This is where individual businesses, industries or households construct and operate their own relatively small scale power supply. Technology is available for wind, solar and hydro generators to supply a range electricity needs. This is currently most efficient in isolated sites where it may not be economic to connect to electricity transmission lines. However, given the rapid changes in technology it might not be long before these become more economic. Electrical supply authorities are, however, investigating using such supplies to connect to the national grid where connection can be made as a way of supplementing existing electricity supply and as an extra incentive to install these technologies. The Southland District Council is currently involved in a renewable energy trial on Stewart Island, the trial is looking at a combination of wind and photovoltaic (solar) energy sources.
- 4.10.2 Furthermore, in some instances, it may be advantageous to upgrade existing facilities rather than construct new ones. Planning frameworks could provide for this measure further. An example of such an initiative was the second tailrace project at Manapouri, which augmented existing infrastructure in the area to create more generating capacity, rather than building new capacity on a Greenfields site.
- 4.10.3 Southland is rich in energy opportunities with its huge lignite reserves, coal seam gas and the potential for natural gas and oil discoveries, but the economic and political conditions must be right if any of these resources are to be explored in the future. Some economic opportunities may be easily achievable but will only have a small impact on the region's energy supply, for example the use of coal seam gas; others have the potential to have a huge impact on our region. With current technology available, Southland is strategically important for New Zealand's future energy security due to its abundance of hydrocarbons. The reality is that until there is a major shift in our society as a whole, we will continue to rely on hydrocarbons as the primary fuel source that runs our economy, -especially transport. This strategic importance needs to be recognised and provided for without compromising the Southland environment.

#### 4.11 **Energy Efficiency**

4.11.1 Energy efficiency has been recognised as being one of the most effective methods of ensuring energy resources are being utilised to their full potential. Energy efficiency opportunities is one of the best investments that a community can make towards providing for its own energy needs. By ensuring energy is optimised in the home or business, the owner is able to use the expenditure saved on other things. Business costs can be reduced, or, as most often happens, the money released is used to invest in other home or business equipment.

4.11.2 Investment in energy efficiency does not always lead to a reduction in the total energy used, but may result in real benefits and increased productivity. Improving energy efficiency results in using less energy to achieve the same benefits, often repaying any outlay in initial expenditure in the upgrade during a definitive period of time. The importance of energy efficiency needs to be recognised in this document, to ensure that the energy efficiency message is picked up through all regional directive planning.

#### 4.12 **Legislative Change**

4.12.1 The consenting process in the recent past has been cited as a major obstacle to the development of new energy resources. Currently if a project is significant enough to the country as a whole then there is a provision for the project to be called in and dealt with by a panel of commissioners. However, there is still a great deal of uncertainty over which projects qualify to be called in, giving the process a great deal of inconsistency. With the recent change of government, there is likely to be a change in the way this area is managed. The new National government in February 2009 released its overview of phase one of the proposed Resource Management (Simplify and Streamline) Amendment Bill 2009. It is possible that an Environmental Protection Agency will be set up under the proposed amendments to deal with regionally and nationally significant issues. This agency would gather together a team of highly qualified people from around the country to deal with all the issues relating to a project. The intention behind the mooted agency is to help fix the perceived shortcomings of the existing RMA processes and to streamline processes for projects of national significance.

### 5. **Conclusions**

5.1 Southland is rich in known and potential mineral and energy resources. It contains New Zealand's largest hydro power generating station at Lake Manapouri and lignite deposits of national and international significance. Exploration for both gas and oil deposits have been ongoing for several years. Southland is well positioned to provide New Zealand with significant sources of energy in the future if infrastructure is developed to get any additional energy out of the region. Development of these resources will have significant social and economic

implications for the region and careful management will be required in order to ensure that adverse environmental effects are appropriately assessed and managed.

5.2 The New Zealand Government has ratified the Kyoto Protocol. As a nation we are committed to reducing our greenhouse gas emissions to the same level as they were in 1990. Legislation to achieve this commitment is being reconsidered.

5.3 The current Regional Policy and Southland District Plan provisions will require revision given:

- the time lag since they were first prepared. While many of the issues identified in the present documents are still relevant, there is a range of emerging issues, including national energy needs, security of supply issues, renewable energy generation, maintaining existing infrastructure, energy efficiency, the impacts of biofuel production and RMA consenting issues, that require regional and local consideration;
- potential developments in the energy sector in the future, particularly with regard to lignite, gas and oil and the subsequent flow-on effects from these;
- the implications of the emissions trading scheme and associated issues will have impacts across Southland; regional and local strategies will be required.

## **6. Questions for consideration**

6.1 The Regional Policy Statement sets the tone for resource management across the region, and any District Plan must give effect to its provisions. The review processes enable the community to reflect on how energy and infrastructure are addressed and whether the current provisions adequately reflect the issues facing Southland. The following are a series of questions in which feedback is being sought:

### **6.2 Regional Policy Statement Questions**

1. Have we identified all the relevant energy issues for Southland?
2. Given the uncertainty of current international energy trends and New Zealand's reliance on imported fuels, should the Southland region promote the use of our vast lignite resources for the benefit for the region and the country, in order for Southland and New Zealand to isolate ourselves from these trends?
3. Given Southland's current electricity transmission constraints, should the region undertake an integrated energy plan process to ensure security of supply and business opportunities for industrial; domestic and rural users?
4. Should the Regional Policy Statement provide further guidance to support and promote energy conservation and efficiency throughout Southland?

### 6.3 Southland District Plan Questions

1. How should the second generation Southland District Plan recognise and provide for the efficient use of energy?
2. How should the second generation Southland District Plan recognise and provide for the environmental effects of climate change?
3. How should the second generation Southland District Plan recognise and provide for the benefits associated with the use and development of renewable sources of energy?
4. Have all the potential sources of energy available in Southland been referred to and which sources of energy should be a priority?
5. How should the second generation Southland District Plan address the provision of energy production facilities (e.g. hydro schemes and windfarms)?