

## 5.1 Introduction

Energy is included in the RM Act definition of “natural and physical resources”. A mandate is therefore given to promote the sustainable management of the energy resource (section 5, RM Act) and to have particular regard to the efficient use and development of the energy resource (section 7 (b), RM Act). The efficient and sustainable use of energy is therefore central to the formulation of policy relating to the production, distribution and use of energy. However, because there is a need to approach the management of energy in a strategic and consistent way, efficiency and sustainability objectives are best implemented at the national level. The regional role, on its own, is less effective. The sustainability of the energy resource is an issue that must be addressed at a national level.

The contribution that the ARC can make to the efficient and sustainable use of energy, apart from encouraging a form of development that is more energy efficient, will mainly be in the fields of education, advocacy and co-ordination.

The supply and distribution of energy is essential for the development, wellbeing, and prosperity of the Auckland Region. However, these activities, to varying degrees, may have adverse effects on the environment.

The ARC has a role to ensure that any adverse effects brought about by the production and distribution of energy are avoided, remedied, or mitigated.

The ARC will also encourage the provision of an adequate supply of energy to the Auckland Region. This will involve inter-regional liaison to ensure that the cross-boundary benefits to Auckland of energy developments located in other regions are recognised. The Auckland Region is a major user of the country’s energy. Its economic viability is dependent upon a continued and reliable supply. Yet at a national level, electricity supplies during peak demand in winter have at times proved to be critically limited. Because little of the energy used is produced in the Region, there is a heavy reliance on imports of petrochemicals, electricity, coal and gas from both outside the Region and the country. The continued availability of a reliable supply of energy is an important cross-boundary issue that is fundamental to the economic and social wellbeing of the Region and the nation.

The ARC has a further role in providing a strategic direction for its Region. The strategic direction for

Auckland, as discussed in Chapter 2, means pursuing a development pattern of urban containment and intensification of development at selected places. Recognition of this direction would be helpful to the energy supply and distribution agencies for their forward planning.

The scale, sequence, timing and relative priority of regional public works, goods and services, is best achieved in the context of an urban development strategy formulated at a regional level.

A further strategic role that the ARC has, is in recognising the regional and inter-regional significance of existing and potentially new utility corridors. Energy utility corridors should be used wherever possible for a number of reasons, including access and maintenance, although it is recognised that because of Auckland’s urban form, and topography, this is not always possible.

In this RPS, energy management is closely linked to, and in part determines, policies relating to urban form, transportation, waste management, air quality and water quality. Because these are major policy areas that can determine Auckland’s future, many of the objectives for energy management are contained in those chapters respectively.

It is to be noted that the following issues all involve important matters relating to the management of energy, some of which can best or only be addressed at a national level. Although the objectives, policies and methods which follow the discussion of the issues are, of necessity, restricted to what can be achieved at a regional level, it is important to be wide-ranging in the discussion of the issues, in order to highlight the limitations of what can be achieved at a regional as opposed to national level. Only then can the methods, and in particular Method 5.4.2 -10, be seen in perspective.

## 5.2 Issues

### 5.2.1 More efficient use needs to be made of energy

There is evidence of the inefficient use of energy in all sectors of activity. This ranges from personal use in the home to community use in a low-density, car dependent, sprawling urban form. There is considerable potential to save energy through behavioural change and adoption of energy efficient technology and practices. However,

because of a general lack of knowledge and complacency among energy consumers, this potential has not been realised. This is despite the fact that energy efficient practices would postpone, or maybe avoid, economic and environmental costs associated with the provision of additional energy producing and transmitting systems. There is a need therefore to increase public awareness of the benefits of energy efficiency and conservation measures.

### **5.2.2 Because of the high dependence on non-renewable fuels, the present use of energy is not sustainable**

Fossil fuels on which reliance is currently placed, globally and nationally, are finite resources. Further reserves continue to be discovered, but no new fossil fuel resources are being created. New Zealand's gas and oil reserves are expected to last into the next century, and although further resources may be discovered and exploited they are nonetheless depleting resources.

The Region's dependence on non-sustainable energy sources, and fossil fuels in particular, is a significant issue. Although fossil fuels will continue to be an important energy source in the foreseeable future, there is a need to recognise that, in the long term, a transition needs to be made from a dependence on non-renewable sources to the use of renewable sources of energy.

There is also a need to obtain, in the short term, greater efficiencies from our existing use of non-renewable fuels. For example, co-generation technologies (such as combined cycle plants that use otherwise waste heat) and the use of CNG/LPG as an automotive fuel, could be encouraged.

Renewable options for energy production which should be encouraged in the Region (subject to acceptance of their locational factors and environmental impacts) include:

- wind
- solar
- tide
- hydro
- biogas (generated from industrial or urban wastes)
- biomass fuels (generated from various agricultural crops).

### **5.2.3 The existing form of urban development in Auckland, including the associated transportation system, is not sustainable in terms of current energy use**

Urban Auckland is large in area and has a low population density by world standards. Its low-density sprawl has been accelerated by the adoption of a motorway system and reliance on the private use of motor vehicles. There is a growing recognition of the environmental costs of such a transport system and the low-density urban sprawl that is determined by it to a large extent. These costs include the continuing expansion of the urban area onto land which is valued for its agricultural, ecological and aesthetic qualities; the emission into the air of a variety of pollutants, including greenhouse gases; and the lowering of water quality of waterways and harbours by polluted runoff from roads. In addition, the current transport system is a relatively high user of energy and relies on consumption of non-renewable resources, not only in the use of land, but also in the use of fuel.

There is a need to develop the transport system in a way which contributes to a more sustainable urban form, and recognises the need for greater efficiencies in energy use.

Policies are needed to reduce both the reliance on car transport and on the use of non-renewable fuel.

The main thrust is through encouraging a form of urban development that results in shorter commuting distances, reduces consumption of fossil fuels, and makes fuel-efficient forms of travel (such as public transport, cycling and walking) more viable.

### **5.2.4 The production, distribution and use of energy is essential for the development, wellbeing and prosperity of the Auckland Region and there would be major socio-economic impacts should, for any reason, the supply of energy be curtailed. However, the production, distribution and use of energy may have adverse effects on the natural and physical environment and some of these effects may be great**

Energy is produced from natural resources. Some of these (such as the fossil fuels – oil, gas and coal) are not renewable, and although they are generally more economic for producing energy, their use may have adverse effects on the environment. Others are renewable (such as wind and solar) and although they are generally

less economic for producing energy, their use may have less impact on the environment.

The transmission of energy, both overhead and underground, may have adverse visual, social or health effects.

Such effects may be able to be avoided, remedied, or mitigated depending upon the circumstances. There may also be positive benefits of energy production within the Region in terms of reduced transmission losses, energy efficiency and a reduced need for overhead and underground transmission lines.

The effects of producing, transmitting and using energy may find expression in various ways:

- By affecting air quality.

CO<sub>2</sub> and primary pollutants, such as lead and other gaseous and particulate emissions, enter the air as a result of the combustion of fossil fuels. Secondary pollutants, such as photochemical oxidants, also enter the atmosphere. Motor vehicle emissions are the largest single source of air pollution in metropolitan areas. They are precursors to photochemical smog and may contribute to global climate change.

- By contributing to possible global warming and associated climatic changes.

The burning of fossil fuels releases greenhouse gases into the atmosphere. These gases (such as CO<sub>2</sub>) enable energy from the sun to reach the earth relatively freely, but then trap in the lower atmosphere some of the heat radiation emitted from the earth. It has been postulated that this process accelerates global warming which could destroy some agricultural and ecosystems and could enhance others. It may cause rises in sea level, climate zones to migrate from the equator, and possibly increase the variability of climatic conditions at a regional and global level.

- By affecting water quality.

Stormwater runoff, containing deposits from roads and airborne particulates from exhausts, are a continual source of water pollution. Exhaust emissions contain lead and hydrocarbons. The largest producers of these are transport related activities. Many of the environmental effects of these activities relate to the amount and type of fuel used by vehicles.

- By affecting ecosystems.

Specific habitats may be affected by the construction of an energy related infrastructure. Ecosystem quality can be affected indirectly by pollution of water, soil and ambient air caused by the production and use of energy.

- By affecting visual values.

Some energy transmission systems (e.g., high tension power lines and pylons) may have a severe visual impact on the landscape.

- By raising concerns related to health and safety.

A certain amount of risk, whether real or perceived, is associated, to varying degrees, with some energy production and transmission systems.

Although the risk of failure of such systems is very slight, in the event of failure there could be major adverse environmental effects. For example, the failure of a nuclear power generation plant or nuclear powered system could have widespread and severe effects on the environment. The current government's anti-nuclear policies are therefore supported in order to prevent the introduction of nuclear energy into New Zealand.

Some energy transmission systems are sometimes regarded as being undesirable neighbours, partly because of the small or unknown elements of risk associated with them. High pressure gas pipelines in urban areas, for example, fall into this category, especially since no one can guarantee 100% against the occurrence of third party interference, or a natural disaster, such as a major earthquake. High voltage transmission lines are another example. Because there are differences of expert opinion related to the health risk associated with them, questions relating to health and safety are increasingly being raised, which in turn engenders public concern.

From a resource management point of view, there is a duty to consider any potential effect of low probability which has a high potential impact. On the other hand, energy transmission systems that cross the Auckland urban area are necessary and their location often unavoidable. In relation to energy health and safety issues, therefore, a precautionary or a 'no regrets' approach, such as placing transmission lines in corridors, often needs to be taken wherever possible.

### 5.2.5 The deregulated energy market and the pricing regimes of local energy supply entities do not necessarily encourage the efficient use of energy

Many organisations are concerned with the development, delivery and use of different forms of energy. These include the various energy supply companies, central government and a number of national and international environmental organisations. These interest groups have overlapping and sometimes conflicting interests. It is therefore difficult to establish, or even co-ordinate, regional policy on the basis of sustainable management of energy. One area where there is conflicting opinions, relates to the pricing regimes of local energy supply entities.

In the absence of national guidance, local energy supply entities may decide their own pricing regimes, and these are not necessarily designed to promote efficient use of energy. For example, existing charging regimes for electricity include standing or fixed charges, which represent the infrastructure costs and overheads of supply authorities, separate from charges for electricity used. Such charges discourage other attempts (such as the use of solar panels) to reduce consumption. This illustrates the need for principles to be established at a national level, which encourage energy efficiency and energy conservation rather than increased energy generation and growth of energy consumption.

Furthermore, under the current deregulated economy, supply companies will be seeking a commercial return on capital invested, and recovery of operating costs. So long as current technologies prevail, many energy users are captive to particular suppliers – the market for energy is not truly ‘free’. In such a situation, conservation objectives can sometimes be in conflict with profit objectives. In this environment, the requirements of the RM Act to promote sustainable management of natural and physical resources (including energy) is difficult to effect.

National direction and leadership is needed, to enable the promotion of sustainable management of energy resources.

## 5.3 Objectives

1. *The sustainable use of energy resources (excluding minerals), and the efficient use and development of energy resources.*

2. *To avoid, remedy, or mitigate any adverse effects of development proposals relating to the production, distribution and use of energy.*

## 5.4 Policies, Methods and Reasons

### 5.4.1 Policies

*The following policies and methods give effect to Objective 5.3 -1.*

1. ***More efficient use shall be made of available energy resources by:***

- (i) ***promoting a reduction in the wasteful use of energy;***

- (ii) ***promoting the application of energy efficiency:***

- (a) ***in the manufacture and use of construction materials;***

- (b) ***in building design and site layout;***

- (c) ***in the design and operation of transport vehicles;***

- (d) ***in domestic and residential situations;***

- (e) ***in business and commercial situations;***

- (f) ***in production processes and industrial situations;***

- (iii) ***promoting the application of other relevant energy conservation and efficiency measures.***

2. ***Renewable energy sources shall be encouraged by:***

- (i) ***promoting alternatives to the use of non-renewable fossil fuels;***

- (ii) ***promoting energy production from the Region’s renewable energy assets, if such production is consistent with the provisions of the RPS.***

3. ***An urban form, supported by transportation systems, which improves efficiency and conservation in energy use, shall be promoted.***

*See also Chapter 2 – Regional Overview and Strategic Direction and Chapter 4 – Transport.*

### 5.4.2 Methods

*Methods 1 to 6 below give effect to Policies 5.4.1 -1 and 2.*

1. ***The ARC will support the role of the Energy Efficiency and Conservation Authority (EECA) in providing to all sectors of the community advice and information on the benefits of energy***

*efficiency and conservation practices, the availability of energy efficient products, and the use of renewable energy sources.*

2. *The ARC and TAs will, where appropriate, endorse and promote EECA findings, in order to increase public awareness about the means and benefits of achieving energy efficiency and conservation and using renewable energy sources.*
3. *The ARC will serve as a role model by implementing energy efficiency and conservation practices in its management programmes.*
4. *The ARC will advocate energy conservation and the adoption of energy efficient practices.*
5. *The ARC will, where relevant, consider the efficiency aspects of energy production and distribution, in accordance with any relevant provisions of the RM Act.*

6. *Provision should be made in district plans requiring consideration of energy efficiency where that is relevant to consideration of the effects of activities in the consent granting process.*

*Methods 7, 8 and 9 below give effect to Policy 5.4.1 -3.*

7. *Policy 5.4.1 -3 will be effected by implementing the policies and methods of Chapters 2 (Regional Overview and Strategic Direction) and 4 (Transport).*
8. *Policy 5.4.1 -3 will be effected by implementing the policies and methods of the Auckland Regional Land Transport Strategy, November 1993.*
9. *Policy 5.4.1 -3 will be effected by supporting the proposal by the Ministry of Transport (in its Discussion document, "Land Transport Management", May 1993) to produce a National Land Transport Policy Statement. The following methods will be requested to be included in this statement:*

- (i) *introduction of regulations, taxes, or other policy instruments, to encourage greater use of renewable motor vehicle fuels, such as biomass fuels or methanol;*
- (ii) *introduction of regulations, taxes, or other policy instruments, to encourage the use of low polluting motor vehicle fuels and penalise the use of high polluting fuels;*

(iii) *introduction of regulations, taxes, or other policy instruments, to encourage the use of vehicles with low fuel consumption and penalise use of vehicles with high fuel consumption;*

(iv) *introduction of vehicle emission standards to ensure that vehicles are properly tuned and that the amount of emissions from each vehicle is minimised;*

(v) *introduction of measures to move motor vehicle taxation from ownership (i.e., vehicle registration fees) to taxes on vehicle use (i.e., fuel taxes based on efficiency, conservation, environmental effect factors, and road user charges) while not increasing the total tax collected from transport users;*

(vi) *introduction of measures (such as a carbon tax or other externality charge) in respect of motor vehicle fuels that reflect the true cost of the use of each transport mode.*

*Methods 10 and 11 below give effect to Policies 5.4.1 -1 to 3, and to matters raised in the issues that are not addressed in the policies.*

10. *The ARC will advocate that central government considers all the above points and introduces a comprehensive and consistent range of measures to promote energy conservation and efficiency, and the development of sustainable forms of energy, and formalise these in the preparation of a National Policy Statement on Energy in accordance with the powers and processes provided by Part V of the RM Act.*
11. *The ARC will establish a regional energy forum to bring together energy interest groups of the Region in order to advocate relevant energy matters on behalf of the Region, including the need for a National Policy Statement on Energy.*

### **5.4.3 Reasons**

Under the RM Act, the ARC has a role in promoting the sustainable management of energy.

Auckland is an energy demanding Region with almost all of its energy being imported.

The supply of energy, and the setting of standards or regulations relating to its production, distribution and use, is, for all practical purposes, outside the jurisdiction

of the ARC. Therefore, policies and methods relating to the sustainable management and efficient use of energy are largely restricted to an educational role relating to:

- conservation (voluntary restraint in demand);
- efficient use of existing energy resources (avoiding waste and achieving more with less);
- diversification from conventional energy sources (replacement of non-renewable with renewable resources).

Where regulation is necessary in order to achieve energy efficiency and conservation, this can be best realised at a national level, because:

- Although the above factors are important issues for all New Zealand regions, the ability of regional councils to resolve these issues in their own right is restricted to one of providing education.
- A consistency of approach is needed among regions in order to achieve conservation and efficiency objectives.
- Regional differences and inter-regional relationships need a national context. Some regions are major producers of energy, major users, or are neither major producers nor users, but incur the impacts of energy transmission.
- Energy is a matter of national significance and can have major effects on the use, development or protection of natural and physical resources.
- There are obligations in meeting or enhancing energy aspects of the national and global environment.
- The assessment of actual or potential effects of any new energy technology needs a national context.
- Conservation objectives, which may be at odds with the imperative for supply agencies (as commercial enterprises) to secure a return on the capital invested, and to recover their operating costs, can best be resolved at a national level.

For these reasons the policies and methods largely rely on national actions in order to achieve sustainable management of the energy resources. Existing charging regimes for electricity include standing charges, which represent the infrastructure costs and overheads of

supply authorities, separate from charges for electricity used. This illustrates the need for the establishment of principles at a national level, which encourage energy efficiency and energy conservation rather than increased energy generation and growth of energy consumption.

Some methods focus on the work of the EECA. This authority is an independent government agency charged with determining and implementing practical measures for achieving greater energy efficiency in New Zealand. It is the key government agency responsible for advising the Minister of Energy on the policies most likely to increase the application of energy efficient practices and technologies.

Method 5.4.2 -11 provides for the establishment of an energy forum. Such a forum could co-ordinate efforts for advocating and achieving sustainable energy management. It could bring together a range of interests, including the energy supply industry, education and research organisations, and environmental and consumer groups and provide a focal point for advocating a national energy policy.

By giving strategic direction to Auckland's development, the ARC, through its regional development policies of containment and selective intensification, is able to provide a framework within which more efficient use of energy may be realised.

Investigations of urban forms and densities indicate that the more compact an urban area and the more land use activities are intensified at selected places, the lower its consumption of liquid fossil fuels, the lower its per capita production of greenhouse gases, and the greater its chance of making fuel-efficient forms of travel more viable.

#### **5.4.4 Policies**

*The following policies and methods give effect to Objective 5.3 -2.*

- 1. Assessment of environmental effects for energy generating and transmission proposals shall, where necessary, be carried out in accordance with the requirements of the Fourth Schedule of the RM Act and any relevant provisions of the RM Act.**
- 2. Nuclear propelled ships and the construction of nuclear power stations shall be prohibited within the Auckland Region.**

#### 5.4.5 Methods

1. *TAs should specify when resource consents will be required for applications relating to the production or transmission of energy. Where a resource consent is required for such activities, the environmental assessment required by section 88 of the RM Act should include an assessment of any actual or potential effects on the environment as defined by section 3 of the RM Act.*
2. *When consent authorities are considering applications for resource consents relating to the production or transmission of energy and are having regard to the Regional Policy Statement under section 104 (1) (c) of the RM Act, they shall, where appropriate, have regard (inter alia) to Chapters 2 and 5 of this policy statement and the extent to which the proposal conforms with the strategic direction, objectives and policies set out in those chapters.*
3. *The ARC will, where relevant, consider the environmental effects of energy production and distribution as part of its resource consent granting process or in accordance with any other relevant provisions of the RM Act.*
4. *District plans will give effect to Policy 5.4.4-2*

#### 5.4.6 Reasons

The above policies are concerned with the avoidance, remediation, or mitigation of adverse environmental effects, and the avoidance of impairment to human health. Both may potentially arise from the production, conversion or transmission of energy.

These policies aim to ensure that the environmental effects of energy proposals are fully considered at the earliest possible stage in the planning process. Depending on the scale and effect of a proposal, assessments of environmental effects may be required at both the regional and district level, so that the full range of regional and strategic implications is understood.

The reason the assessment referred to in Method 5.4.5 –1 reiterates the need to consider the full meaning of “effect”, and the reason why consent authorities (under

Method 5.4.5 -2) need to have regard to the extent that the proposal conforms with the strategic direction, objectives and policies of Chapters 2 and 5 of the RPS, is that these matters are often overlooked. Proposers of major developments often neglect to discuss or evaluate indirect, future or cumulative effects, and the way those effects impact on regional growth patterns.

Methods 5.4.5 -1 and 5.4.5 -2 are therefore a reminder to proposers of major energy developments and consent authorities that when impact assessments are produced under the fourth schedule of the RM Act and when resource consents are heard for major proposals, the meaning of “effect” needs to be interpreted in its widest sense (under section 3, RM Act) so that the assessment considers Regional “growth” and other strategic issues for which the ARC has a responsibility under its integrated management functions of sections 30 (1) (a) and 59 of the RM Act.

Other policies to achieve the energy objectives are spread throughout the RPS. In particular, policies that deal with air and water quality, the health of ecosystems, Regional development, energy from waste, and transport, can all be seen as relevant policies for achieving Objective 5.3 –2. Collectively, these policies set standards of environmental quality within which activities associated with energy generation and transmission have to operate.

### 5.5 Environmental Results Anticipated

- (a) There is a sufficient supply of energy to meet the social and economic needs of the Region’s population.
- (b) More efficient use of energy.
- (c) Progressive reduction in the Region’s dependence on non-renewable resources.
- (d) Avoidance, remediation or mitigation of any adverse effects of generating and distributing energy.

### 5.6 Monitoring

The ARC will liaise with the EECA to determine an appropriate programme for monitoring energy efficiency.