

Report on Submissions
Draft New Zealand
Energy Strategy to 2050

October 2007



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Executive Summary

In December 2006, the Government released a draft New Zealand Energy Strategy (NZES) to 2050 for consultation with the public. The Ministry of Economic Development received 331 submissions on the NZES from the energy industry, major energy users, other commercial interests, community organisations, non-government organisations, local and central government, Maori, academia, research organisations and interested members of the public. Some of the key issues raised in submissions are summarised below.

On the vision

Many submitters sought clarity on the linkages between the NZES and other government initiatives such as the sustainable development programme of action, the Government's Growth and Innovation Framework and wider policy programme.

There was widespread support from organisations and individuals alike, for a greater focus on demand-side energy and transport management. There was a view that the NZES focused too much on efficiency at the expense of energy conservation.

Submitters pointed out that the objectives of security of supply, low cost and low emissions, rather than being complementary were in competition. There was much discussion of how these competing objectives could be balanced and traded off and mixed views on the balance and weighting that should be given to different aspects.

A cost benefit analysis was seen as an essential ingredient, missing from the NZES. It would make potential trade-offs between the objectives more explicit. Some submitters suggested co-benefits, rather than just least cost, should be taken into account in determining preferred policy choices.

There was comment about targets, or lack thereof in the NZES, from many submitters across sectors. However, there was little consensus on the nature or level of targets to use. The general view seemed to be that measurable targets are needed to drive the strategy by defining how much we want to achieve and by when and enable an assessment of the success or failure of different policy choices.

There was strong support for energy costs to include the cost of environmental externalities and general agreement that there had been a market failure to cost carbon that justified market intervention by Government

Submitters considered carbon costing initiatives should be broadly based and not focused solely on one sector.

There was concern that the critical and continuing role of oil and gas in the energy system was overlooked in the strategy. Greater clarity and acknowledgement of the ongoing role of gas in the energy mix, and its critical role in meeting long term energy needs through thermal electricity generation and direct use of gas, was sought.

Some submitters, particularly with commercial interests, have ongoing concerns about the impacts of policies on energy prices and consequently business competitiveness.

Maori organisations noted the NZES and other climate change documents failed to recognise the Treaty of Waitangi.

Submitters across the range of sectors called for policy stability and certainty relating to energy policy, possibly through cross party agreement.

The range of issues, lack of details regarding costs and benefits and the importance of the issues to the New Zealand economy prompted submitters to advocate for another round of consultation before the NZES was finalised.

Resilient low carbon transport

Submitters were critical of the limited focus of the objectives for transport. While recognising that in the short term using alternative fuels and increasing the fuel efficiency of vehicles (the main focus of the proposed actions) would help reduce greenhouse gas emissions from the sector, many submitters considered this insufficient to achieve significant emissions reductions. More focus is needed on demand management and modal shift.

Another criticism of the transport objectives was the under emphasis of the role urban land management and structural change in improving energy efficiency in the transport sector.

Views were mixed on biofuels. Those offering qualified support for biofuels had concerns about engine technology incompatibility, compatibility of biofuels with the imported vehicles, warranty implications, increased costs (and the impact on business competitiveness), delivery infrastructure concerns and the implications for small petrol distributors. Other submitters were concerned about the negative net energy equation if biofuels are generated from non-sustainable sources and rejected biofuels as an option.

The detailed actions on improving fuel efficiency (mandatory labelling, import restrictions, variable costs, sales weighted fuel standard, improving driver behaviour and commitment to fuel economy) were supported by the majority of organisations and individuals commenting as worth further consideration.

There was a high degree of support from many organisations and individuals for ongoing investment in public transport.

Many also sought more recognition and support for active transport modes such as walking and cycling, car pooling and other measures to reduce the number of vehicles on the roads.

Concern was expressed from several quarters about the NZES promoting a shift in the vehicle fleet from petrol to diesel vehicles to reduce CO₂ emissions and the potential negative impacts on air quality.

A number of submitters noted that the strategy should include policies to limit emissions in the aviation sector.

Security of Electricity supply

There was a high degree of comfort with the role of the Electricity Commission as a market regulator and endorsement of the regulatory reviews currently underway.

Lines businesses continued to promote deregulation of their activities and support the direction of the Government's proposed changes to the Electricity Industry Reform Act 1998

(EIRA) to make it easier for lines companies to invest in generation in network areas outside their own. Major electricity generators had mixed views on liberalisation. The main concern was the potential for anti-competitive behaviour.

A recurring theme was that the NZES should focus on and recognise the range of and diversity of all New Zealand's indigenous energy sources – renewable and fossil fuel alike – and their ongoing importance in meeting the strategy's objectives. The critical role of thermal generation in providing security of supply should be recognised and the role of gas clarified. As it stands in the strategy has the potential to disincentivise exploration for both oil and gas and investment in infrastructure.

Submitters endorsed the work to be undertaken by the Electricity Commission on the impact of wind generation development and the impacts of this on the wider power system.

There was widespread recognition that a strong and robust transmissions grid was fundamental to implementation of the strategy. Four themes recurred:

- major investment in the transmission grid is required to enable the NZES vision, with its emphasis on an 100% renewables future, to eventuate
- investment in the transmission grid should precede development of renewable generation as the lead in times for transmission development are likely to exceed those for generation
- a high renewables mix requires a particular transmission grid formation given intermittency – planning needs to commence at an early stage
- investment in transmission infrastructure remains urgent and must be progressed.

Transpower provided a detailed submission on transmission issues. They considered the NZES should acknowledge the pivotal role that transmission will play in meeting the objectives and recommend a technical work stream be established to resolve complex and critical transmission issues.

Demand side management was supported by submitters from a wide range of sectors including local government, academia, environmental NGOs, interest groups, electricity and lines companies. Demand management was seen as a key to reducing emissions and pressure on supply networks.

Low emissions power and heat

There was support from all sectors and from individuals that energy suppliers and other emitters should increasingly face the costs of the greenhouse gas emissions they produce.

There was a clear preference for a price based measure though differences in the preferred mechanism, its characteristics, the timing of introduction and whether other complementary policy options are required to incentivise renewable development. Commonalities were that any price based mechanism should be broad-based, there should be strong links with international markets, and the competitiveness of New Zealand industry should be protected.

A key area of divergence was around the timing of introduction of measures. Some stakeholders, particularly with environmental interests, considered measures should be

introduced without delay (and often promoted a carbon tax), others especially with concerns about competitiveness at risk continue to stress the importance of not moving ahead of our major trading partners.

There is support for the contribution distributed generation (DG) can make to security of supply. Cost of plant and equipment, was seen as a barrier to distributed generation along with, contractual and pricing arrangements for transmission and distribution, the price received for generated electricity and the regulatory environment.

Some suggested that if Government wants to promote DG then some form of intervention, such as feed-in tariffs, will be required to support a viable industry.

Fossil and electricity sector submitters noted that parts of the NZES focus on gas for electricity generation rather than an energy source in its own right, not recognising the efficiency benefits of direct use. They considered NZES should endorse the direct use of gas.

There were mixed views around carbon capture and storage, some saw it as a way to continue to use fossil fuels in the future and exploit New Zealand's indigenous resources (gas, oil, coal, hydrates, coal bed methane etc.) and reduce emissions, while others felt that the technology was still some way off and will remain uneconomic.

There were divergent views on the operation of the Resource Management Act in relation to renewable generation. Stakeholders who are applicants to the RMA (large and small renewable energy and fossil fuel generators, Transpower, and a few major users) continue to perceive the RMA as a barrier, despite recent reforms. These stakeholders tend to welcome initiatives to streamline and speed up the consenting process. Local Government considered the draft NZES should focus on improving the use and understanding of the mechanisms already in place through national guidance under the RMA for renewable generation and improvements to regional planning processes.

Using energy more efficiently

Submitters recognised the importance of energy efficiency measures in reducing energy costs, reducing emissions and improving security of supply. There was, however, divergence in opinion on whether Government leadership should be in the form of awareness-raising and provision of information, regulation or a combination of both.

There were divided views on the proposals to adopt a lower discount rate for cost benefit analysis of energy efficiency and other activities proposed in the strategy. Those supporting a lower rate viewed it as in accordance with social cost benefit analysis. Others suggested specialist advice on the correct rate should be sought and the outcome of the Treasury review of discount rates awaited. Justification for the rate chosen should be included in the strategy.

Major energy users, while generally supportive of energy efficiency proposals, want existing energy efficiency achievements acknowledged. Many firms are operating at word's best practise or close to it and there are strong commercial drivers for ongoing efficiency improvements.

Sustainable technologies and innovation

Two themes emerged in submissions on the preferred approach for Government support for research and development. A number of research organisations, business groups and local government favoured a broad approach to developing low emissions, energy efficient affordable technologies that refrained from supporting some technologies over others. Others preferred direct Government support for specific technologies.

Many submitters supported increased funding for research and development on a contestable basis.

Some submitters commented that the current research funding environment leads to competition, rather than collaboration, amongst researchers. Collaboration between universities, Crown Research Institutes, industry, and other technology partnerships, were recognised as central to a successful energy R & D strategy.

Comment on the proposal to establish a new sustainable energy research centre was generally positive though there were different views on the form this should take. A new organisation could be established or an existing centre of excellence in energy research supported and expanded.

It was recommended New Zealand maintain strong international links to maximise uptake of technology and technology adaptation.

Some submitters suggested the Government needs to encourage private sector involvement in energy-related R&D and uptake of emerging environmental technologies by way of tax incentives, capital grants and subsidies.

There was support for a fund for marine development but some concern that this alternative promising technology has been singled out over others. Submitters directly involved in marine research and development were in support.

Affordability and well-being

There was recognition from consumer groups, interest groups, local government and business groups that the variable impacts of policies, and effects of any price rises, on low and fixed income groups needs to be considered and mitigated. Fuel poverty was recognised by some as a growing problem.

Local Government and other submitters reiterated the need for Government to take a more active role in development of sustainable urban form and transport infrastructure.

Reflecting this they considered that the term “mobility” should be replaced with accessibility – accessibility implies access to services and localities but does not necessarily require or imply increased travel.

Other Matters

Grey Power recommended an officially recognised and properly funded consumer advocacy organisation be established to ensure the interest of individuals, households and small business are properly considered. Maori noted their capacity for engagement was also limited and needs support.

Local Government seek greater recognition of local government's role in implementation of the NZES and are looking for tangible support from Government in regard to implementation.

Other submitters noted skill shortages and lack of expertise in the area of energy efficiency services, in constructing new technologies, in the technical and engineering skill-base, in the building, architectural and engineering trades on solar and other energy efficient devices. Work needs to commence now to develop skills where shortages exist or are likely.

Introduction

In December 2006, the government released a draft New Zealand Energy Strategy (NZES) to 2050¹ for consultation with the public. The draft NZES sought public views on the government's proposed vision for New Zealand's energy future, the broad directions by which this vision could be achieved, and proposed actions the Government could take to support its vision.

The NZES was part of a suite of discussion documents looking at energy and climate change initiatives such as carbon pricing and measures to address land use sources of greenhouse gas emissions. They were:

- Measures to Reduce Greenhouse Gas Emissions in New Zealand Post 2012
- Transitional Measures for Electricity and Stationary Energy Supply
- Draft New Zealand Energy Efficiency and Conservation Strategy (NZECS)
- Sustainable Land Management and Climate Change Action Plan

This report is a summary of the main points of those responding to the proposals set out in the NZES only. Separate summary reports are available on the other energy and climate change discussion papers.

Number and type of submissions

The Ministry of Economic Development received a total of 331 submissions on the NZES from the energy industry, major energy users, other commercial interests, community organisations, non-government organisations, local and central government, Maori, academia, research organisations and interested members of the public.

These submissions can be broken down into the following groups:

Sector/interest group	Number of submissions
Academic & Research	25
Business & Industry sectors:	
- Agriculture / Dairy	3
- Energy	42
- Forestry	6
- Other	10
Central & Local government	31

¹ See Ministry of Economic Development, Draft Powering Our Future; Towards a Sustainable Low Emissions Energy System, December 2006, http://www.med.govt.nz/templates/MultipageDocumentTOC_24480.aspx.

Consulting & Professional	14
Maori (Iwi)	5
NGOs:	
- Environmental/Community/Other	47
- Business (includes Chambers of Commerce, professional and business associations)	38
Individuals	109
Other	1
Total number of submissions	331

Many submitters provided integrated submissions on more than one of the energy and climate change documents. Where possible, submissions not received by MED but covering matters relevant to the NZES have been identified. Eighteen submissions were received indirectly from other agencies. They are not included in the above statistics.

Appendix 1 lists the names of individuals and organisations who provided comment.

One pro forma submission (submitted 1688 times) was received based on a template prepared by Greenpeace. It was sent to the Ministry for the Environment. It contains comments relevant to the NZES. Where relevant those comments are included in the summary.

Nature of submissions

The NZES invited the public to answer a series of questions or submit a statement in a form of their choice on the proposals set out in the NZES.

Many of the submissions from organisations were in the form of reports or papers. Many are substantive and detailed. Some organisations and individuals provided additional input in the form of papers, reports or articles. Often the submissions were not made in isolation but were part of a comprehensive set of comments directed across the range of energy and climate change discussion documents. Some organisations provided statements and responded specifically to the consultation questions.

A feature of the business and industry submissions was generally to direct their substantive comments to the sector in which they operate and have expertise. There was a natural division between those with interests in stationary as opposed to transport energy.

Individuals either completed the on-line questionnaire or provided a statement of their views.

Approach to reviewing submissions

This review of submissions is qualitative rather than quantitative. This is a result of the breadth of the discussion paper, the broad range of responses received and the small percentage answering questions directly.

Submissions on the NZES were read and analysed using the following process:

- submissions were divided between individuals and organisations
- organisations were divided into sector groupings: individual responses were divided into those answering the consultation questions and those providing a statement of their views
- the responses were reviewed by sector to extract high level issues and messages, new policy proposals, relevance of the submission to policy work streams, and commentary on the consultation process both to date and future expectations
- submissions were further analysed and core comments about the issues and actions set out in each chapter of the NZES identified
- the main points have been extracted to make up this summary report.

This report follows the structure of the draft NZES. It is written in 9 parts:

- Vision
- Our choices
- Resilient, low carbon transport
- Security of electricity supply
- Low emissions power and heat
- Using energy more efficiently
- Sustainable technologies and innovation
- Affordability and wellbeing
- Other matters

The report does not cover every issue raised by submitters. It focuses on key areas and themes submitters consider need attention as the Government moves towards finalising the strategy. Where appropriate common views across sectors are noted, and divergence of views across or within sectors.

Submissions will continue to be analysed by relevant officials involved in developing further policy advice to Government on the final form of the NZES, subprojects currently underway and future projects that are endorsed and prioritised in the final strategy.

Towards a sustainable low emissions energy system

This section summarises some of the key concerns raised by submitters relating to the proposed vision statement.

Context

Some submitters suggested the context for the development of the draft NZES was inadequately set out. Some considered that the NZES in its final form should spell out the drivers for responding to energy and climate change issues more clearly in terms meaningful to stakeholders and the general public. More detail, for example, was suggested around New Zealand's obligations under the Kyoto Protocol including the costs of failing to comply and the potential local environmental impacts of failing to reverse climate change.

Linkages with other policies

Many submitters felt that the description of the linkages with other Government policies was inadequate. There was a call for clarity on the linkages and relationship between the NZES and other Government initiatives such as the Government's:

- previous energy policy work including, the Sustainable Development Programme of Action and the Sustainable Energy Framework
- Growth and Innovation framework
- wider policy programme as articulated in strategies such as the New Zealand Transport Strategy, National Waste Strategy and legislation such as Local Government Act 2002 and Land Transport Act 1998.

Some submitters, particularly non-government organisations with environmental interests and Maori, suggested an overarching strategy was required, perhaps a National Sustainable Development Strategy, so that there exists a long term sustainability strategy with a hierarchy of other strategies and action plans, including a national energy strategy to support it. This would provide cohesion and avoid an ad hoc and inefficient response to a critical resource.

Trade unions noted that adaptation to climate change and practical responses should be done in the context of a sustainable framework that includes social, cultural and economic considerations.

Local Government submitters in general supported the vision statement though also sought more explicit commitment to a sustainability framework for New Zealand energy policy to improve its clarity and intent. They considered this would act as an organising framework and tie the various documents focusing on climate change together. It would provide a base for energy policy to be considered in the wider policy context so that implications of decisions will be considered not just in terms of energy objectives but also downstream effects, for example, on water policy or health outcomes.

Others expressed concern that the strategy did not reference New Zealand's economic growth objectives. Business interests were strongly of the view that New Zealand's energy strategy should improve economic performance and be consistent with and linked to the Government's economic growth objectives. It was noted that NZES is silent on GDP growth expectations and how the strategy will ensure there is sufficient energy to deliver the level of growth expected and desired.

Our Vision

There was a high degree of support for development of a long term strategy for the New Zealand energy system. The three drivers - security of energy supply, affordability and the need to respond to climate change by tackling carbon emissions from energy production and use – were recognised as important. Support however was usually qualified. Some thought the vision was not strong enough to combat climate change issues: others saw it as too focused on climate change at the risk of security of supply, reasonable cost and economic well-being.

Many submissions suggested the vision and core objectives be fine tuned, some provided alternative vision statements, or suggested adoption of objectives already developed in other countries or other regulatory frameworks within New Zealand. Other submitters took a more generic approach and recommended a change in emphasis in more general terms. The suggestions often reflected strongly held views on what the NZES's priorities should be (and ultimately the best mix of policies to achieve the goals). Similar patterns emerged within sectors, and there was some cross sector alignment of views.

Critique of vision and objectives

Major electricity generators were particularly vocal in discussion of the nature of the objectives. They sought greater clarity and a stronger outcome orientation. They not only had suggestions for change but criticised the way the vision statements and objectives were phrased. Several considered that the objectives did not state clearly enough what was sought from a policy intervention. One preferred objectives which were relatively neutral as to how the outcomes would be achieved to avoid stifling feasible and innovative alternative responses.

Others noted that the vision and statement of principles were not sufficiently outcome-orientated. They considered these were methods of achieving objectives rather than objectives themselves.

Drivers and directions

Many, particularly with commercial interests want the NZES to clearly signal the importance of security of supply and least cost as the principle objectives, while recognising that New Zealand has a commitment to sustainability and reducing greenhouse gas emissions. Suggestions included refining the vision statement to indicate that the future energy system should not only be reliable and resilient but also efficient and affordable. Other suggestions included reference to maintaining New Zealand's international competitiveness and enhancing New Zealander's quality of life.

Recognition of the role of the market in efficient resource allocation was another principle that many in the business community considered should be more strongly reflected in the vision statement. There was, they considered, no need to predetermine the generation mix or indicate a preference for renewable development. The strategy should establish a basic framework so each type of technology faces the costs it imposes, including emissions, and can then compete on a level playing field. The market would operate to determine a generation mix that provides secure supply at least cost.

Several submitters in the energy sector noted the disconnect between the Government Policy Statement on Electricity Governance (GPS) and the NZES. One submitter suggested that the vision should be modelled on and encapsulate the objectives of environmental sustainability, efficiency, equity and security of supply as set out in the GPS. They considered that the vision and objectives as stated, by deviating from the GPS statement, tilted the focus of the draft NZES, away from being an Energy Strategy to a Climate Change or a Greenhouse Gas Reduction Strategy.

Others in the business sector suggested establishing a clear hierarchy as a useful way to rephrase the objectives. Several quoted the council of European Union objectives as set out in the Energy Policy for Europe. It ranks the three objectives of security of supply, ensuring the competitiveness of economies and the affordability of energy, and promoting environmental sustainability and combating climate change. Others suggested that the importance of economic prosperity be elevated, without compromising New Zealand's international responsibilities for emissions.

Other submitters, preferring a sustainability approach noted that the drivers of the NZES should not be economic development alone but a "well beings" approach, consistent with the Local Government Act 2002, that considers environmental, social, cultural and economic factors.

Supply vs demand management

There is wide support from submitters, organisations and individuals alike, for a greater focus on demand-side energy management. There was a view that the NZES focuses too much on efficiency at the expense of energy conservation.

Views were mixed however. Many submitters considered a reduction in total consumption of energy alone would attain many of the goals of the strategy. Others sought an equal balance between efficiency and energy conservation. Others recognised that demand management had a place however saw efficient and emerging technologies both in the transport sector, in electricity storage capacity and a range of other areas as having the ability to provide clean solutions and thus should remain a high priority in the NZES rather than the focus being suppression of demand.

The lack of emphasis in the vision statements on reducing both stationary and non-stationary energy consumption was a core concern particularly of environmental organisations and sustainable transport advocates. These groups saw reduction in energy consumption as the key objective – it would mitigate the impacts of climate change and improve security of supply. The tenor of these submissions was that climate change is a demonstration of limits on growth, that continued economic growth is unsustainable, that factors driving energy

demand need to be managed and economic growth decoupled from growth in energy demand. Several submitters provided revised vision statements and objectives for the NZES articulating this approach the primary objective being to reduce greenhouse gas emission through reducing fossil fuel and electricity consumption.

Local government also saw the objectives and principles as too supply focused. They assert more emphasis needs to be placed on demand side measures and energy conservation and their role in meeting energy objectives. Local Government NZ sums it up - a shift is required to elevate the role of efficiency and efficiency opportunities. In particular there is under emphasis on the potential role of demand management particularly in the transport sector.

Lines companies also emphasised the potential for demand management initiatives and suggested a strong focus in this area.

Urban/rural needs

Several groups, in particular local government noted that that the NZES focused mainly on urban issues. The NZES needed flexibility to recognise different economic, geographic and social characteristics. Rural options needed to be fleshed out e.g. energy issues facing farming households and dispersed rural communities. Important regional issues such as security of local power supply and the transport needs of rural communities were overlooked.

Getting the balance right - trade-offs

Submitters pointed out that the NZES objectives of security of supply, low cost and low emissions, rather than being complementary were often in competition. There was much discussion of how these competing objectives would be balanced and traded off and mixed views on the balance and weighting that should be given to different aspects.

Many submitters in the business sector, including major electricity users, major energy companies and energy companies with fossil fuel interests viewed the vision statements as too heavily weighted towards climate change at the expense of economic growth. Some considered climate change mitigation policies should be consistent with the objectives of energy security and competitive pricing but not take priority over these core objectives. Several considered that a comprehensive climate change strategy should be independent from an energy strategy altogether.

Several submitters suggested the vision statements should explicitly recognise that trade-offs will be required and establish principles, to support the vision, that indicate how those trade-offs will be made.

Other submitters saw climate change mitigation as the key driver while recognising that any potential regressive social or economic effects of change might require mitigation.

Assessment of impacts

Cost-Benefit Analysis

Many submitters, particularly those with commercial interests, saw the lack of any cost benefit analysis as a major flaw in the draft NZES. A cost benefit analysis would make potential trade-offs between the objectives more explicit.

Some felt it was premature for the Government to seek public support for a low emissions pathway in the absence of a full assessment of the costs and benefits of various future energy scenarios and combinations of policy choices. Others said the NZES was already “picking winners” and “losers” without a robust assessment of the consequences and stressed that choosing a high cost low emissions pathway without supporting analysis was risky both in terms of consumers standards of living and the international competitiveness of our export sector.

Not only did submitters suggest a cost-benefit of the policy package the Government proposes, some also sought a rigorous cost benefit analysis of each action that incorporates the full range of benefits, i.e. savings in electricity costs, investment in electricity generation avoided and reduction in GHG emissions.

There were mixed views on the appropriate discount rate to be applied to cost benefit analysis (see section on energy efficiency) and it was recommended that research be undertaken to determine the externality values to be used for climate change effects.

Some parties asked to be consulted on the cost-benefit analysis, others thought the methodology should be designed with stakeholder input or be reviewed by an expert panel.

Co-benefits approach

Several groups including local government and the health sector favoured a co-benefits approach to assessing the costs and benefits of policy choices. Assessment of proposed policy measures, they consider, needs to include the full range of impacts with preferred policies showing co-benefits rather than just being the lowest-cost measures.

Policy choices providing the greatest collateral benefits, which could be derived from improvements in air quality or general health for example, should be prioritised. It was suggested a health impact assessment would be a useful way of making energy and health linkages more explicit.

Targets

There was comment about targets, or lack thereof in the NZES, from many submitters across sectors. However, there was little consensus on the nature or level of targets to use. The general view seemed to be that measurable targets are needed to drive the strategy by defining how much we want to achieve and by when and enable an assessment of the success or failure of different policy choices. Targets suggested include: GHG emissions, percentage of energy from renewable sources, energy intensity, and reduction in oil use.

One of the most prominent groups advocating firm targets were environment NGO's. The lack of targets both national and by sector in the draft NZES was seen as a major flaw by these submitters. There was a high degree of unanimity among those suggesting explicit targets. Targets were expressed either as maximum greenhouse gas concentration targets and/or percentage reductions on New Zealand's greenhouse gas emissions compared to 1990 levels.

Some of the targets suggested were:

- a maximum long run or medium term greenhouse gas target of between 350-450ppmCO₂ equivalent
- long term emissions reduction target across the economy of 80-90% reduction compared to 1990 levels by 2050 with reductions of 20% - 30% in GHG emissions by 2020
- targeted 30% reduction in greenhouse gas emissions from the energy sector by 2030
- targets of up to 100% for renewable stationary energy by 2050.

There was a call for near-term national targets to be translated into realistic sector targets based on the best information available about potential emission reductions. Several submitters suggested that targets be binding possibly within a legal framework.

Several energy companies also suggested targets, which if underpinned by legislation, would recognise both the growing public importance of climate change issues and provide some certainty over long run policy direction. Targets and a timetable for meeting them could help control the rate of change and secure business and consumer confidence. Several noted that targets have been legislated, or will be legislated in several jurisdictions, citing the UK's draft Climate Change Bill.

A contrary view was expressed by another energy company who considered that there is nothing to be gained from targets – the critical thing is that emitters face the international cost of their emissions – this incentive should be sufficient enough to ensure reductions in emissions over time.

Strategic leadership

There was criticism from submitters on the principles the Government had set out to guide decisions taken as the strategy is finalised.

Energy companies in particular considered that the supporting principles should set out more clearly the parameters around the policy choices government is going to make and what factors will drive those choices. Modifying the principles would make more explicit how policy choices would be made and what the trade-offs would be. This would provide a sounder basis for decision making and help promote business confidence and investment certainty.

Some general themes to emerge around the content of the Government's statement of principles were:

- strong support for energy costs to include the cost of environmental externalities
- general agreement that there had been a market failure to cost carbon and that this justified market intervention by Government
- a view that carbon costing initiatives should be broadly based and not focused solely on one sector. Any greenhouse gas charge should be broad based and apply to all sectors according to the amount they emit. Singling out sectors (e.g. electricity or transport) would put them at a disadvantage relative to other sectors of the economy.

100% renewable generation future

There were concerns about the Government's statement that it is preferable for all new electricity generation to be renewable, except to the extent that is necessary to maintain security of supply:

- was not a principle, but a policy choice
- sent the wrong signals to the gas and oil market. The statement could potentially discourage both gas and oil exploration, result in a decline in (or stranding of) existing infrastructure and investment and contradicted the Government's recent initiatives to encourage exploration.

Greater clarity and acknowledgement of the ongoing role of the gas industry in the energy mix, and its critical role in meeting long term energy needs through thermal electricity generation and direct use of gas, is required.

It was also noted, particularly by those involved in the petroleum industry, that there was little recognition or discussion of the future for developing New Zealand's indigenous oil reserves. As a submitter noted fuel resources are not so abundant that the strategy can disincentivise fossil fuel generation or exploration.

Some submitters considered the NZES should recognise in the vision statement the importance of utilising all of New Zealand's indigenous energy resources. A strategic focus for each fuel type could then be explored in the strategy.

Not all submitters held this view. Environment NGO's, many individual submitters, some energy companies and those with interests solely in renewable energy supported a 100% or close to 100% renewables future, though there was recognition that fossil fuels will remain part of the mix during the transition. Some submitters sought the phasing out of all fossil fuels unless carbon emissions can be securely sequestered.

Security of supply at competitive prices

The impact of policies on prices remains a concern particularly for major energy users, exporters and business groups. While supporting the security and affordability objectives of the NZES, major energy users were of the view that there was an urgent need for least cost strategies for the electricity sector because the competitive price advantage relative to Australia in particular is rapidly decreasing. One noted that any increase in NZ electricity prices relative to Australia and Asia would seriously jeopardise the viability of their NZ operations. Business groups:

- Were concerned that most of the proposed actions are likely to be high cost and that any artificial environmental costs applied out of step with our trading partners could see significant loss of business. NZ must take care before taking any unilateral action to reduce GHG emissions or move ahead of our trading partners.
- Considered that Government energy and climate change policies must be cognisant of business reality.
- Noted that global consensus was yet to be achieved on how emissions are to be reduced, and that NZ policy should not be finalised until the time when such a consensus is reached.

- Were concerned that if economic activity is moved offshore in response to higher domestic costs and distribution it would be bad for our economy and global emissions would not be reduced at all (“carbon leakage”). They could increase if the new destination had less lenient climate change policies.

Other submitters while expressing caution noted that in the long run a strategy that expands our use of renewable energy could improve NZ competitiveness. The impact will be magnified as fossil fuel prices rise and carbon pricing becomes further embedded in the global economy.

A major exporter noted that climate change concerns are already influencing customer and supply requirements, as such, there was a need to anticipate the directions major trading partners are moving in and develop initiatives so New Zealand can respond quickly as market requirements change. Transitional arrangements however need to be carefully managed to avoid disproportionate front end costs.

The economic impacts from higher energy prices, some suggested, especially for energy intensive exporting industries and other vulnerable sectors, could be compensated through a range of measures such as a combination of negotiated greenhouse agreements, enhanced depreciation on energy saving investments, subsidies and possibly tax reductions in other areas.

Fuel Poverty

There was recognition amongst submitters that some policy choices could disadvantage low and fixed income New Zealanders. Many noted that there was a need to ensure low and fixed income New Zealanders are not disadvantaged by regulatory tools.

The growing problem of fuel poverty, where by some consumers are disadvantaged by having to pay a larger percentage of the total income on energy, particularly heating, was raised by several submitters as an emerging issue.

Policy stability

Submitters across the range of sectors called for policy stability and certainty relating to energy policy. Clear, certain government policy in the energy sector was needed with initiatives designed so that they are fairly applied, effective in reducing emissions, and do not put New Zealand's economy at undue risk. Some suggested cross party agreement on the NZES, others indicated that another option was to embody aspects in legislation referencing the UK Government's draft Climate Change Bill 2007 as an example of a legislative means of stabilising policy.

Companies involved in developing new renewable generation emphasised the capital intensive nature of supplying renewable energy and the need for clear, coordinated, long term (at least 10 years and up to 25 years) stability in government policies that incentivise renewable energy developments to allow financing of the projects.

Electricity companies thought it was critical for the Government to make timely decisions that can be stuck to as Governments change. The investments in this energy sector (and particularly renewable energy investments) are capital intensive and have lives spanning decades. Changing policies create the risk of value being undermined. This risk inclines

companies to either delay investment or to risk less capital (as is possible with thermal investments in contrast to renewables investment).

Concerns of Maori

Maori interests noted that throughout the NZES (and associated discussion documents on climate change) there was no reference to the Treaty of Waitangi, the founding basis of the relationship between the Maori people and the Crown. The document should be at the forefront of any policy development that impacts on the Maori people.

There were concerns that climate change policies generally might adversely affect property rights - settlement assets should not be negatively affected by any policy established post settlement.

The consultation process was also criticised. There was insufficient internal Maori input and no external Maori input into the policy development process, no discussion of quadruple bottom line reporting, and not enough time or resource for Maori to consult Maori. There was a suggestion that independent economic and social analysis of the proposals on the Maori economy including iwi, iwi settlements, small blocks, large blocks occur and that the effects on Maori be monitored.

Our Choices

Themes emerging from submitters commenting on this section, which considers the impact of choices made on energy security and greenhouse gas emissions, was that the NZES gives only one view of expected outcomes over a 25 year horizon, that data supporting the projections and models was inadequate to support policy analysis, and more publicly available information on modelling and assumptions was required.

It was noted that the projections seemed optimistic, particularly in the ability of new renewable energy generation to deliver secure supply at reasonable cost. In the face of uncertainty, submitters recommended modelling a number of scenarios and clarifying the assumptions behind the scenarios presented. The decisions to be made will be long-term, of considerable economic importance and in some cases irreversible.

One submitter suggested using for the energy sector the scenario analysis approach developed and used by the Electricity Commission to ensure robust analysis of alternative scenarios is undertaken.

Energy security

Peak Oil

Several submitters noted that peak oil issues are too readily dismissed, further serious exploration is required and background facts to support comments included. They consider the demand for oil in developing countries continues to rise while production remains flat or declining therefore expect a considerable increase in oil prices in the next few years. They question the NZES statement that this will spur exploration and thus keep prices down. The NZES because it is long term and because of New Zealand's high dependence on imported fuel should prepare NZ for reality of declining fossil fuels, look at a range of peak oil timeframes, their implications and realistic workable transitions to more sustainable energy, especially transport, systems.

Pathway to a Low Emissions Future

Reducing energy sector emissions

Local Government interests had concerns about the projected reduction in greenhouse gas emissions possible from energy efficiency measures in the transport sector.² It was noted that the data suggests far greater reductions in CO₂ can be made by fuel efficiencies and alternative transport fuels than by transport modal shift or reducing demand. Modelling undertaken for the Auckland Regional Growth Strategy and the Auckland Regional Land Transport Strategy indicated otherwise. It was suggested that more scenarios should be modelled and further analysis was necessary to inform decisions relating to transport. It was also suggested that the assumptions used when modelling future scenarios should be set out clearly.

² Figure 4.1 – illustration of emissions reduction opportunities in transport energy

Another submitter questioned the validity of the models used to estimate future emissions from the transport sector. They noted that it was likely that the models underestimated the likely growth in emissions from transport because the GDP growth rate and the connection between GDP growth and emissions growth might be conservative. They note that there is insufficient publicly available information to make an informed opinion and suggest:

- models be open to public scrutiny to allow discussion and critique to take place. This should result in more credible predictions
- opening the models would allow other parties to inform their own positions and apply their experience leading to more informed debate.

Effect on prices

Electricity prices

Submissions from the major energy companies provided detailed analysis of the costs of alternative sources of new generation. These models are not described in detail in this report.

By and large however submissions from the major energy companies were highly critical of the analysis in the NZES³. The broad thrust of criticism was that costs of new renewable electricity generation, particularly wind, were too low, and cost of coal-fired generation was too high leading to a slanted view that much of our new generation could be met by renewables without a significant increase in generation costs.

There was a view that while future renewable growth was favourable it would not be of the scale to meet the Government's objectives.

One submitter noted the escalating costs of the Meridian West Wind project as an example of rising capital costs. High global demand and prices for wind turbines and exchange rates movements are also contributing factors.

Energy companies providing their own analysis of the costs of new wind generation roughly indicated prices for new generation about \$10/MWh-\$20MWh higher than the NZES estimates. They considered the NZES analysis optimistic.

Views on the growth rate, and costs, for geothermal generation were mixed – some considered growth would be slower and more costly than the scenarios set out in the NZES. Others had no critique of the estimates.

The over optimistic cost projections coupled with unrealistically low electricity demand growth assumptions (1.3% compared with historic growth rates of 2%⁴) led to a view that:

- significant increases in prices can be anticipated

³ Generation supply curves had been developed based on New Zealand's Energy Outlook to 2030, updated with revised information from industry sources.

⁴ The draft NZES draws on the scenarios from 'New Zealand's Energy Outlook to 2030' and forecasts that annual electricity demand growth for the next twenty to twenty five years will fall from a historical average of about 2% to a figure around 1.2%-1.3%. Many submitters, particularly in the stationary energy sector saw this growth rate as unrealistically low. As one submitter put it what would be the consequences if there was a higher growth rate? How will the generation gap be filled?

- diversity of supply will remain important with fossil-fuel based generation remaining a significant part of the energy mix for some time.

Resilient Low Carbon Transport

Objectives/Direction

Submitters in general were critical of the limited focus of the NZES objectives for transport. While recognising that in the short term using alternative fuels and increasing the fuel efficiency of vehicles (the main focus of the NZES proposed actions) would help reduce greenhouse gas emissions from the sector many submitters considered that this would be insufficient to achieve significant reductions.

Consequently submitters suggested redrafted objectives including recognition of demand side measures and clear, measurable and more ambitious targets. They also proposed a range of other measures be considered either as part of the NZES or in detailed action plans.

There was strong opposition from some sectors, including local government, environment NGO's, sustainable transport advocates, some transport organisations and individuals to the objective "continue to meet the demand for transport services". This objective some considered was not feasible. It would do little to alleviate congestion, environmental issues or fuel consumption and it was unclear how it related to other objectives in the NZES and NZEECS which promote reductions in GHG emissions from transport, reductions in kilometres travelled and mode shift, for example.

Many suggested the objective be amended to give more recognition to initiatives to manage transport demand by encouraging a shift to lower impact modes.

Local Government wants to see the focus of the NZES on behaviour change and travel choices first and foremost. They suggest a hierarchy of actions based on the 1998 Transport and Environment Select Committee Inquiry into the environmental effects of transport. The hierarchy is:

- reduce the need to travel
- choose a low impact means of travel
- choose a low impact propulsion system
- improve the efficiency of propulsion.

They note that the draft NZES focuses primarily on the third and fourth tier and suggest a focused programme based on the first two steps in addition to actions to improve vehicle and fuel efficiency. Environmental organisations, sustainable transport advocates and many individuals supported this or a similar, more holistic focus.

Several submitters noted that maximum emissions reductions are achieved by working through the hierarchy in a systematic way and ensuring actions at different levels are mutually reinforcing.

Whilst the weight of opinion indicated that broader objectives were desirable, other submitters expressed support for the objectives as they stood, recognising that improvements in vehicle and fuel efficiency would provide the quickest short term gains. Several suggested more emphasis on efficient technologies and practices rather than

focusing on suppressing transport demand. Technological advances for the heavy truck fleet in particular hold the most promise for emissions improvements, according to submitters with interests and dependencies in that area.

Land use and transport planning

Another criticism, which reflects the view that the objectives of the NZES for transport are too limited, is the under emphasis of the role urban land management and structural changes can have in improving the energy efficiency of transport. Government was urged to take a stronger role in the development of more sustainable urban form and transport infrastructure changes. These, some submitters noted, are the key drivers of consumer energy demand.

A section in the NZES, or sub strategy, devoted to urban design, urban form and travel demand management was suggested. Local government, one of whose primary roles is investment in transport and shaping built environments, seeks a partnership and further dialogue with government on this issue, perhaps leading to a section in the NZES on urban form and the built environment.

Targets

In line with the call for national targets for GHG reductions, ambitious targets are sought by many submitters, for transport. Several environmental organisations who were specific about targets proposed the following:

- 15% reduction in net transport carbon emissions on 1990 levels by 2025
- 50% reduction in net transport carbon emissions on 1990 levels by 2040
- 90% reduction in net transport carbon emissions on 1990 levels by 2050

Urban/rural needs

Lack of recognition of the different transport needs of rural and urban dwellers was noted.

Comments, issues, actions

Developing and adopting future fuels

Biofuels

Views on biofuels ranged from high degree of support for development to those expressing extreme caution or rejecting development and uptake outright. Some submitters want the Government to accelerate the programme for development of biofuels recognising they had a role in security of supply and fuel self reliance as well as environmental benefits, others are skeptical that biofuels will solve fuel problems. Many recognised the limitations of obtaining biofuels from sustainable sources and the possibility that biofuels may have unintended adverse implications which exacerbate climate change.

Those offering qualified support for biofuels had concerns about engine technology incompatibility, particularly for heavy duty truck engines, compatibility of biofuels with the imported vehicles, warranty implications, increased costs (and the impact on business competitiveness), delivery infrastructure concerns and the implications for small petrol

distributors. There was also risk of stranded investment if biofuels were overtaken by rapid development of other technologies.

Submitters in the oil sector, commented specifically on the minimum biofuels sales obligation. Their comments and suggestions were:

- The proposed rate and pace of introduction fails to take account of the lack of biofuels infrastructure plant or supply in New Zealand and the age of the vehicle fleet. Hurried introduction could result in serious vehicle reliability issues thereby undermining consumer confidence. The Government should work with industry to ensure the availability of quality biofuels and develop appropriate infrastructure and consumer guarantees prior to introduction of the sales target.
- Another company considered the current proposal is too flexible in the way companies can meet their biofuels targets, allowing, for example, the offering of both standard and biofuel blends concurrently. As biofuel blends will be more expensive than standard fuels the proposal as it stands could delay penetration. They suggested that Government should mandate a minimum bioethanol blend and a minimum biodiesel blend into existing fuel grades.
- Another suggested maintaining current mandate levels and reviewing them every 5 years depending on the availability of locally produced biofuel feedstocks, available biofuel technologies, prevailing engine technology in the NZ fleet and outcomes of cost benefit analysis and consumer uptake.

Several submitters said incentives would be necessary to stimulate biofuel development. One suggested a portion of road user charges equivalent to the level of the sales obligation and any penalties be collected in a fund that would be distributed for investment in domestic biofuel production to help overcome cost barriers to development of the biofuels industry.

Other submitters rejected biofuels as an option. Submitters had concerns about the negative net energy equation if biofuels are generated from non-sustainable sources and noted that often significant fossil fuel input was required. The high environmental costs associated with their production particularly where there is a reduction in food crops or deforestation as a result was another concern.

Advanced diesel technology was considered more promising by some submitters and should be promoted for the heavy and light vehicle fleet including cars and family vehicles

Electric Powered Vehicles

There was a high degree of support from most sectors and individuals for initiatives that would stimulate the uptake of hybrid and electric vehicles in the New Zealand fleet, especially if increased demand for energy to power hybrids was from renewable sources.

Some submitters noted that penetration of hybrids and electric vehicles into the fleet would be slow and that the electric vehicles were not a good option for rural areas.

There was qualified support from energy companies though measures, possibly mandatory, would need to be introduced to ensure electric vehicles are only charged off-peak and by means of a special plug.

One company saw spin off benefits in terms of the introduction of widespread electrical storage media into the network. If appropriate charging regimes are introduced than this provides an opportunity to load-smooth and gain greater utilisation of distribution and transmission systems. However, incremental system costs would more than triple if charging occurred at peak times.

Another suggestion was that research was required into the relative merits of electric versus hybrid vehicles to see which were the most efficient and effective for New Zealand conditions.

For the heavy truck fleet, hybrid trucks hold good promise for reduced emissions. As it is a dominant mode of land freight internationally and given world commitment to GHG reduction there will be a high degree of focus on technological improvement. To facilitate uptake NZ should make sure our regulations are consistent with those of potential technology suppliers and the NZES should focus on policies which will encourage uptake of superior technologies.

Hybrid/fuel cell vehicles were not seen as a viable option for the long distance bus/coach fleet at this time.

Improving fuel efficiency of vehicles

The proposed actions in this section of the NZES (mandatory labelling, import restrictions, variable costs, sales weighted fuel standard, improving driver behaviour and commitment to fuel economy) were supported by the majority of organisations and individuals commenting on this section as worth further consideration.

Some submitters, especially with interests in promoting sustainable transport systems, considered the NZES did not cover pricing mechanisms that can influence travel behaviour, reduce car journeys and increase use of active modes sufficiently.

Other submitters stressed that the single most effective measure would remain price. Introducing a price for emitting carbon would be the most efficient way of changing user's behaviour and also encourage investment in low emissions technology – such as electric and hybrid vehicles.

A submitter mentioned not enough use is being made of existing legislation regarding vehicle emissions and standards of imported vehicles, these minimum standards should be enforced.

Some submitters expressed concern about price based measures as higher costs of transport will impact hardest on low income citizens.

Several suggested revenue raised from price based measures should be funnelled back into the transport sector to fund other initiatives such as increased investment in public transport.

Reasons given by submitters not supporting some of the fuel efficiency measures were:

- do not support varying the costs of purchasing vehicles based on vehicle fuel efficiency as this sanction does not reflect kilometres travelled or actual fuel usage
- support restriction based on vehicle age provided there are exemptions for classic cars.

Distance based charging for all vehicles

There was recognition that distance based charging could have a role in influencing consumer behaviour. It would need to be supported by affordable and accessible public transport. Some commented that it seemed complex – fuel taxes could achieve the same effect and more cheaply.

Several mentioned anomalies in the current road user charge system which act as a disincentive to the uptake of more efficient vehicles and suggested these be reviewed. E.g. Light weight diesel vehicles for example pay a disproportionate amount of RUC (compared with contribution to road wear and tear) under the current system.

More efficient means of transport

Public transport

There was a high degree of support from many organisation and individuals for ongoing investment in public transport. Many also sought more recognition and support for active transport modes such as walking and cycling, car pooling and other measures to reduce the number of vehicles on the roads. It was noted a switch to active transport modes has significant collateral health benefits.

Local government noted that funding support for these modes remains a small proportion of total land transport funding. The imbalance needed to be addressed and long term certainty of funding was sought. Others suggested changes to the activity class funding mechanisms so that sustainable transport modes received priority.

There was recognition that for public transport to succeed, and for behaviour change to occur, it needed to be cheap, efficient and, importantly, convenient.

New Zealand Shipping Strategy

In the transport sector, most submitters considered there would be more value in an integrated cross-modal freight strategy, rather than a shipping strategy. The strategy should consider the roles of all the potential freight modes. Rationales for this view included:

- a focus on shipping was contrary to integrated planning and multi-modal transport objectives
- a freight strategy could look at a wider range of issues including inter modal transfers and congestion at inter modal rail and port terminals
- opposition to promoting a particular mode of transport, which tended to result in each strategy simply promoting that mode.

Some submitters representing road freight carriers considered the NZES had a clear bias against road freight and noted that there was no evidence that distorting the playing field in favour of rail or coastal shipping will result in an increase in energy efficiency or economic efficiency.

There was endorsement for a shipping strategy from some quarters, particularly shipping industry representatives, some environmental NGO's and individuals who noted more needed to be done to promote shipping (and rail) with investment directed towards the lowest

net emissions methods of moving particular items. It was suggested the strategy should not be limited to a port-to-port approach but, door-to-door and that coastal shipping be included in future rounds of the Surface Costs and Charges Study

Another suggestion was for the scope of the strategy to include port policy issues such as the long term effects of climate change on ports and the impacts of this for long term infrastructure planning.

Industry submitters noted:

- there is often limited ability to adopt alternatives to road freight especially for time and temperature dependent products
- the focus should be on an integrated strategy and improving the interfaces between the modes.

Increasing limits for truck weights and dimensions

Several industry submitters noted that the most readily available fuel efficiency saving would come from an increase in heavy truck loading rates. Increasing loading would enable fleet reductions and significant emissions saving. Road transport industry representatives also held this view. They considered removing existing regulatory impediments to efficient road transport, including New Zealand's limits on truck weights and dimensions, would give significant energy (reduced fuel use) and economic efficiencies without having an adverse impact on rail or coastal shipping.

Security of Supply

The need for secure fuel supplies was recognised given New Zealand's high dependency on imported fuels and its importance to the economy. Realistically, the dominance of oil as a source of transport fuel will remain for a long time. It was suggested New Zealand expand initiatives to encourage and facilitate oil exploration to improve self sufficiency in oil.

Diversity of transport fuels

Submitters commenting on this section were aware of the possibilities for alternative fuels in providing energy security and emissions reduction in the transport sector. They discussed the potential of a range of technologies for biofuels and suggested a range of other potential biofuel sources:

- methane capture from biological material for rural and remote areas
- biodiesel from tallow can make a small contribution in the short term
- growing conversion of and processing of cellulosic feedstocks (this is an areas New Zealand can use its strengths in agricultural science and wood processing technologies) to produce ethanol.

Several submitters in the transport sector considered CNG should be included in the fuel mix. It is an indigenous fuel, is widely available and has an emissions profile equal to or better than petrol or diesel. Government was urged to take a serious look at modern CNG applications and delivery infrastructure. LPG for light and heavy vehicles was also supported as a "here/now" fuel that was technically reliable.

For buses and coaches liquid based fuels mainly as derivatives or a blend of diesel have the most promise. Technologies such as extenders in the form of alcohols or esters also offer good opportunities. CNG and LPG are not seen as an option for this fleet.

Several submitters noted that lignites should not be discounted as a potential source of liquid fuels in the long term. Other submitters considered there was too little focus on hydrogen technology (and too much on biofuels). This is the main future energy source for transport – 100% CO₂ and particulate clean. A hydrogen pathway should be included in the strategy.

Other issues and policy proposals

Air Quality

Concern was expressed from several quarters about the NZES promoting a shift in the vehicle fleet from petrol to diesel vehicles to reduce CO₂ emissions. These submissions noted it was essential any such a move should not result in an increase of particulate emissions. There should be no trade-off for any initiative for climate change if another aspect of the environment, for example air or water quality deteriorates.

Aviation

A number of submitters noted the omission of the aviation sector from the strategy. Some saw this as a considerable oversight given:

- the attention this is receiving overseas
- that emissions at altitude are estimated to have greater impact than those at ground level
- industry growth is outpacing emission reductions through technological improvements.

Policy suggestions for aviation included:

- better data collection and assessment of lifecycle emissions
- air emissions are included in international agreements
- excise tax on aviation fuel domestically and internationally (if consistent with overseas practice)
- establish a GHG emissions cap for international travel to and from NZ
- working with the tourism industry to prepare for the changing nature of tourist visits.

One submitter noted that there are no technological solutions to emissions from aviation. Growth in air travel is exceeding possible increases in aircraft efficiency and hydrogen and biofuels are not suitable alternatives. They expected once global limits on emissions start to have an effect international travel could be curtailed. New Zealand will be at a carbon-disadvantage compared to other destinations and this should be addressed, by for example, ensuring tourists have a low emissions profile within New Zealand.

The aviation sector noted the price of fuel was a strong incentive to maximise fuel efficiency for both aircraft and ground operations.

Other recommendations

Other recommendations for policy included:

- Review the institutional and funding systems for land transport in light of climate change objectives. Present institutional and financial arrangements favour road building over other transport modes.
- Consider tax incentives for the uptake of more efficient new technologies or those meeting higher standards than those in force in New Zealand. Submitters cited accelerated depreciation, differential fringe benefit tax rates or adjustments to GST levels as options.
- On public transport, suggestions included giving priority to electrification of Auckland rail, promoting integrated ticketing and broadening the focus of rail from urban rail to consideration of commuter rail between urban areas, reflecting the fact that people are choosing to commute long distances to work.
- Develop strategic interregional and urban freight routes.
- Use technology developed overseas more that would help reduce energy consumption e.g. better highway management; electronic road user charges, travel information and vehicle navigation systems.
- Implement a moratorium on highway construction and free up funds for alternative modes.
- Investigate workplace alternatives such as condensed working weeks and access to services via the internet to reduce travel demand.
- Investigate the infrastructure, institutional and business barriers hindering uptake of telework, and work with existing telework providers and promoters on measures to increase uptake.
- Develop a deposit and rebate system to encourage removal of older vehicles from the road.
- Introduce compulsory fuel use meters in clear view of the driver on all new cars and those less than 10 years old.
- Introduce measures to promote car pooling.
- Provide Government support for facilitating the uptake of energy efficient lighting (street and traffic) systems.
- Develop greater capacity and expertise in the sustainable transport field.
- Use social marketing techniques to encourage behavioural change in individuals personal decisions on transport mode use.
- Investigate a domestic carbon quota scheme for individuals.

Security of electricity supply

This section of the New Zealand Energy strategy contains actions to help meet one of the key objectives of the NZES – to maintain high levels of security and reliability of electricity supply at reasonable cost.

Submitters unequivocally recognised the importance to New Zealand economic and social well being of maintaining secure electricity at competitive prices. For the major energy users, in particular, security and quality of supply is critical to maintaining business confidence and economic growth. Together with affordability it is one of the two key factors underpinning business confidence in the New Zealand energy system and should be a primary objective of the NZES.

This summary of submissions focuses on some key areas submitters commented on and key actions proposed by government to maintain security of supply. Most of the substantive comment was received from major electricity generators, lines companies, those with interests in fossil fuels or renewable generation. Submitters often noted, particularly on regulatory actions currently in progress (e.g. investment of lines companies in generation) that detailed submissions had been made to the appropriate Government organisations on their views and that engagement would be ongoing.

Security of supply in a market context

This section of the NZES set out the key characteristic of the NZ electricity market – the competitive market structure. It notes that no central planning for investment in generation exists. This combined with investment decisions being made by firms in response to commercial drivers can create a perception that the system is insecure.

The NZES notes that the Government has considered a return to centralised decision making arrangements to improve security of supply. Its preferred approach is to improve current market arrangements.

Submitters responded to these comments in a number of ways.

Some suggested that national planning for future developments should be reintroduced with Government calling for the construction of hydro or geothermal resources when additional capacity is perceived to be necessary.

Some Environmental NGO's and individuals suggested:

- a re-evaluation of the use of markets should be undertaken including their role in servicing New Zealand's energy requirements and producing desired outcomes
- steps must be taken to restore community ownership of and responsibility for energy and electricity in particular;
- a cooperative approach and values that will facilitate and encourage more reliable energy production and better energy savings than the current commercially focused system was needed

- measures should be introduced to prevent large generators and electricity supply companies from exerting market power individually or working as a cartel to the detriment of electricity consumers.

The push for greater central planning contrasts with the views of others, both individual, interest groups and the electricity sector who agree with the Government's conclusions that improvements in the current arrangements are more desirable than a shift to centralised decision making.

It was noted that the electricity market is designed to deliver pricing signals that encourage timely investment in generation and to date this has been successful as the lowest cost generators have generally been brought on line at an appropriate time.

Several major electricity generators confirm that the competitive market is delivering the required growth in generation to meet market demand, and that security of supply issues are less of an issue than they have been in recent years.

Some electricity companies, both generators and lines companies, note that the current market arrangements, particularly price volatility in dry years, can affect the public perceptions, both consumer and investor, of security of supply. They recommend ongoing education so there is a better general understanding of the market, its mode of operation and the role of the Electricity Commission in security of supply under the direction of the Government Policy Statement. The Electricity Commission, as market regulator, should have an educative role as one of its core functions.

Interestingly, individuals answering the question on whether more needs to be done on public confidence, were divided equally in their views. It was noted that the Electricity Commission was a step in the right direction and suggested data on reserve capacity and the costs of providing electricity during periods of peak demand be published.

Role of the Electricity Commission

Generally there seems to be a high degree of comfort with the role of the Electricity Commission (EC) as a market regulator. There was no questioning of the need for the EC, though there was some discussion around the division of responsibilities between the EC and EECA. One electricity company considered that the EC role should be more targeted to markets and security of supply with EECA dealing with efficiency issues.

Several companies underscored the need for an independent Electricity Commission given that the Government was potentially compromised through both owning assets (electricity State Owned Enterprises, Transpower and Solid Energy) that are affected by EC regulation, and possibly directly affecting EC policy decisions.

Electricity Market Arrangements

There was limited comment from submitters, though some endorsement, on the regulatory reviews currently underway.

Lines companies supported the review of the Commerce Act regulatory provisions. They note a clarified or modified Act could provide greater incentive and confidence for lines companies to invest where it is efficient to do so.

It was suggested a new initiative for promoting lines company investment in energy efficiency and conservation. They suggest s57E of the Commerce Act be amended to allow pass through of a portion of costs associated with lines company investment in energy efficiency and conservation. Currently line companies are discouraged from investing in energy efficiency because this can reduce demand and therefore income.

Several submitters stressed that the EC market design review to be conducted in close contact with consumers and address a wide range of options for price responsive demand. Major energy users thought the scope of the review should be broader. Another submitter considered protracted market reviews by the Commerce commission and EC was a potential cause of regulatory instability.

Lines company investment in generation

Lines businesses continued to oppose regulation in their area and support the direction of the Government's proposed changes to the Electricity Industry Reform Act 1998 (EIRA) to make it easier for lines companies to invest in generation in network areas outside their own. It was noted, by lines companies, that the proposals to date fall short of what is fully required to encourage generation investment. They note that the proposals for board directors to sit on both lines company boards and arms length boards of a generation company and the removal of constraints on hedging and spot trading are positive. However, restrictions or barriers such as accounting separation and restrictions on local area retailing still exist, that are likely to continue to hinder investment in distributed generation.

It was suggested that ongoing concerns about anti-competitive behaviour associated with own network wholesaling and retailing could be addressed through specific regulatory measures.

Another suggestion was that a distinction be made between community/consumer owned businesses and private companies as the community/consumer businesses will naturally act in the interests of their owners when compared with a profit-driven monopoly. In those cases it was suggested that lesser regulatory compliance requirements could be applied.

Major electricity generators had mixed views on liberalisation. Some gave qualified support for the proposals but reiterated their view that lines companies should not be able to own generation facilities or provide retailing within their own networks. Those opposed cited:

- Ongoing risks of monopoly lines businesses using their position to reduce competition in the contestable segments of the electricity market by favouring their own generation or retailing activities over competitors.
- The underlying rationale – to facilitate greater investment in the electricity industry leading to greater supply – is flawed. There is no evidence to indicate a shortage of parties willing and able to make timely investments in new generation.
- Section 81 of the EIRA, which enables lines businesses to seek an exemption for the provisions of the Act, is sufficient to enable variations from the EIRA requirements.

Generation Sources

There was much discussion regarding the appropriate energy mix to meet the two pronged objectives of the NZES – security of supply and reductions in greenhouse gas emissions.

A recurring theme was that the NZES should focus on and recognise the range of and diversity of all New Zealand's indigenous energy sources – renewable and fossil fuel alike – and their ongoing importance in meeting the strategy's objectives. Indigenous supplies of gas and coal are essential to the security of supply of electricity which in turn is critical to the New Zealand economy. The NZES, some thought, downplays their role.

Of note were concerns about:

- the need to recognise the ongoing and critical role of thermal generation in providing security of supply
- under recognition of the role of gas in the strategy which has the potential to disincentivise fossil fuel generation, exploration for both oil and gas (gas often being a by product of oil exploration) and investment in infrastructure.

The discussion in this section focuses on these concerns, plus responses to the Government's proposed actions in relation to wind generation development. More detailed discussion of the feasibility of a 100% renewables future is covered in the section on low emissions power and heat.

Ongoing Critical Role of Thermal Generation in Security of Supply

Many submitters across the sectors recognised and acknowledged the need for thermal generation in the electricity system. The degree to which thermal played a role varied.

Electricity and lines companies and the fossil fuel sector considered that gas and coal will continue to play a critical role in future generation and future energy use. They gave a number of reasons for this view including

- provides flexible, reliable weather-independent generation
- is characterised by high efficiency, especially in terms of co-generation or tri-generation
- it can be located close to the market it supplies reducing the need for transmission upgrades and reducing transmission losses
- provides a low cost option that can benefit the economy in terms of future generation.

They also suggested that a balanced mix of thermal and renewable electricity for security of supply and affordability was needed, wind being a key part of the mix. This was supported by submitters from consultant and interest group sectors.

A submitter from the major user sector said hydro with thermal back up (mainly gas) will form the backbone of our generation system in the medium term. Grey Power submitted that thermal generation should be used to conserve hydro so that winter peaks could be met.

Within the renewables and interest group sectors there was general agreement that there was a need to have a high level of renewable generation with a number of submitters saying

that all new generation requirements should be renewable and a significant increase in renewable generation should not compromise security of supply. Thermal generation plant should not be allowed except to provide security of supply to the national grid. One renewable submitter considered that it is not only technically possible but also economically desirable that at least 95% of New Zealand's electricity generation be derived from renewable energy resources.

Role of Huntly Power Station

Electricity sector submitters considered that Huntly had a number of advantages because of the nature of the plant and its location. It can provide a frequency keeping function, peaking and emergency generation, is located close to the Auckland load centre and avoids further reinforcement of the transmission line into Auckland.

It was pointed out that the market is unlikely to force the cessation of Huntly generation. It will eventually compete on a purely short-run basis in contrast to the renewables which require recovery of the long run costs.

A submission from an academic group noted that a rising price of carbon should eventually squeeze coal fired Huntly out of the market but the resulting higher power prices may hurt the economy. A more proactive approach is to have Huntly move to a dry year support role with appropriate commercial arrangements with Genesis and the market. (This would incur extra cost to the sector, recovered, perhaps by a levy.) Under this scenario it would afford certainty for additional renewable energy to replace Huntly coal.

If Huntly is displaced then there could be major investment in peaking plant (probably diesel-fired because of the lack of a suitable supply of gas) and this could be counter to the emissions goals of the strategy.

Other points made were:

- co-firing Huntly coal with biomass is a possibility
- as the percentage of wind generation increases it is expected that increased reserves will be required to manage stability and frequency. Huntly coal could assist (on agreed terms) as experience is gained.

The Role of Gas

There was a widely held view amongst electricity companies, gas companies and the fossil fuel sector that the NZES does not recognise the fundamental importance of natural gas in NZ energy system. It was noted that:

- there is a conflict between efforts to encourage gas exploration and signals that gas is an emitting fuel to be displaced. The signals contradict other Government initiatives aimed at encouraging exploration
- while parts of the NZES focus on gas for electricity generation the efficiency benefits of direct use are insufficiently recognised
- the importance of gas to NZ security of supply, particularly with the variability of most of our renewable power sources, is under recognised

- gas is a cleaner energy source than coal and can have a significant role in reducing greenhouse gas emissions for the electricity sector. These sources of generation should be dealt with separately in the NZES.

The consequences of the mixed signals in the NZES could be:

- a perception that the demand for gas will reduce in the future which will discourage investment in exploration for both oil and gas (with the risk of greater reliance being placed on coal or imported LNG as the alternative energy option)
- a risk that long life investments in the gas sector could be stranded
- a reduction in the viability of infrastructure investments, the gas market and erosion of the skill base. In the future the gas market could benefit from new carbon capture technologies putting it on an equal footing with renewables. This situation should not be foreclosed.

Powerco and Vector had jointly funded a substantial study by NZIER on “The Gas Sector and the Energy Strategy”. This recognised market failures in the form of both non-reflection of emissions cost and of the value of security of supply, which justified a measure of market intervention. However the report saw a risk that efforts to restrict new non-renewable capacity risked scoring an ‘own goal’.

Specifically the NZES proposal “is likely to:

- increase the probability that gas will be imported into New Zealand for use in electricity generation
- encourage the replacement of gas-fired reserve capacity by diesel-fired standby generators, with adverse economic and environmental consequences
- increase the price volatility of electricity in New Zealand and raise the average cost, with adverse economic consequences and
- Encourage calls for further intervention by the government to cap electricity prices and to build reserve generation capacity.”

It was suggested that the strategy should:

- reconsider the critical role for gas, including direct supply
- recognise the role gas can play in reducing greenhouse gas emissions by replacing coal-fired generation
- Create and maintain an economic environment that encourages investment in domestic uses of natural gas reserves as this is critical to encouraging exploration and development of gas in NZ. To develop these discoveries a significant domestic market for natural gas, such as for electricity generation, is necessary in order to permit co-extraction of the high value liquids and further increase energy self sufficiency.
- Ensure NZ remains attractive for new exploration and production investment
- endorse direct use of gas. Lack of endorsement acts as a disincentive for investment and consumer choice

- recognise the benefits of different uses of gas – residential, commercial, industrial and electricity generation.

Geothermal Energy

Several submitters stressed the importance of our geothermal resource. There are abundant resources that can be consented and developed. It was considered that geothermal should be acknowledged as a strategic resource.

Geothermal is a renewable energy source that can provide base load generation, adding to security of supply. It does not however have the flexibility to counter the rapid and significant swings in wind generation. While there are some CO₂ emissions, they are low in comparison with thermal generation.

Many future developments will have some benefit for local Maori interests by virtue of their land ownership (and kaitiakitanga role) within the geothermal fields.

It was suggested the exploration for geothermal resources would be encouraged by developing a regime that protects the investment of prospecting parties. The minerals discovery and development regime was cited as model.

Wind generation and security of supply

The NZES notes that at current levels, wind generation is not yet a source of supply risk though a significantly larger share of wind generation could make supply less secure. Further work is to be undertaken by the Electricity Commission to assess the impact of wind generation development and wider power system implications.

This work was endorsed by submitters. The work will help understanding the impacts of significant renewables and the necessary infrastructure requirements that will be required to support greater reliance on wind generation. It was suggested the NZES should address the reliability of wind in much greater detail as a component of the overall power system, not in isolation.

Submitters with strong interests in wind generation noted that a geographically dispersed generation portfolio greatly increases reliability and can provide a reliable base load (this however was estimated at around 10% of total installed capacity). It was noted that over longer timeframes, wind can be less volatile than hydro schemes. They advocated for greater industry participation in the Electricity Commission project and proposed that government fund development of a wind forecasting system.

Other submitters were more cautious and considered that winds' variability has implications for security of supply, will put pressure on other generation types to make up the shortfall, and can not be relied on to meet peak electricity demand.

The Transmissions Grid and Distribution Networks

There was general recognition amongst submitters from various sectors that a strong and robust transmission grid was fundamental to implementation of the strategy. A robust transmission grid is essential to:

- maintain security and reliability of supply

- enable effective competition in a national market (and thus encourage least cost energy delivery)
- promote and support a range of generation options which are often geographically distant from the consumers they supply.

Four themes recurred across submissions commenting on this issue;

- major investment in the transmission grid is required to enable the NZES vision, with its emphasis on an 100% renewables future, to eventuate
- investment in the transmission grid should precede development of renewable generation as the lead in times for transmission development are likely to exceed those for generation
- a high renewables mix requires a particular transmission grid formation given intermittency – planning needs to commence at an early stage
- investment in transmission infrastructure remains urgent and must be progressed.

Transpower provided a detailed submission on transmissions issues. They considered the NZES should acknowledge the pivotal role that transmission will play in meeting its objectives and recommend a technical work stream be established to resolve complex and critical transmission issues. Other recommendations were:

- “Acknowledge that, in order to maintain security as and when investment in intermittent generation exceeds the limits of the current system, timely decisions need to be made in terms of generation mix, dispatch systems and transmission capacity”
- “Facilitate, clarify or, if necessary, legislate to establish unambiguous property rights for Transpower to maintain, replace, refurbish and augment its grid assets”
- “Provide clear national direction to local and regional authorities on how to achieve sustainable management of transmission assets to allow Transpower to invest in existing assets more efficiently and to acquire designations for likely future transmission investments”
- “Facilitate market investment in generation by ensuring adequate transmission capacity exists ahead of time. This will enable the development of prime areas of renewable resource for generation”
- “Support Transpower and the Electricity Commission to develop an integrated approval framework”
- “Use Transpower’s expertise as transmission asset owner, grid planner and system operator, to develop the policy and regulatory framework required to realise the Government’s vision for a renewables future.”

Major electricity companies noted major investment is required in transmission to enable the vision, one suggested investment in to order of \$350M, over and above currently planned investment in the core grid to maintain security of supply.

Several submitters noted that some areas are already supply-constrained. For example, there are capacity constraints with the Taranaki transmission and distribution network which imposes limits on generation from more efficient plants e.g. Stratford cogeneration plant.

There was support for a robust transmission system from within the renewable sector. Wind farms cannot occur at significant levels nationally without a robust and interlocking transmission network, and will often require upgrades to the grid. Government commitment is required to provide a better transmission infrastructure and well defined grid connection rules.

For geothermal energy, reliable infrastructure links are also critical for development, especially into Auckland from the immediately developable high temperature geothermal resources at Ngawha and Taupo/Rotorua areas.

Interest group submitters recognised the importance of the transmission system with comments such as:

- More detailed analysis of energy supply and demand and transmission capacity is required to provide investors and users of the plan that the projections are robust and will assure security of supply, by region, in both the short and medium term. Energy demand growth and peak loadings in the top half of the North Island are considerably higher than the national average. Despite this, geographic distribution of energy demand has not been addressed in the strategy. This is a significant security of supply risk.
- Simplify the regulatory structures and approval processes for transmission.
- The national grid will have an increasingly pivotal role in transporting renewable energy, often from remote locations, to customers. It will also need to balance demand and supply between regions during generation outages as well as balancing supply from wind and other forms of intermittent generation.

Major electricity users also recognised the importance of the transmission system. They supported the role of EC particularly in ensuring investment in the transmission grid. They recognise that much of our generation is far from the loads it serves so a strong transmission system is needed. Adequate transmission infrastructure is critical to providing the flexibility needed to maintain security of supply with a high level of renewables.

Councils of the Auckland region considered that supply is not secure in their region though vital for economic development. Security could be improved by diversifying the location (both within and to the North) and scale of electricity generation (preferably from renewable sources). Resilience of supply could be improved by taking a new approach to grid reliability, one that is customer focused and related to duration and frequency of outages. This could result in further design work to transmission networks to create dispersed multiple pathways to reduce reliance on a few.

Gas Market Arrangements

Little comment was received on this particular topic. It was noted:

- the gas industry needs to develop and maintain a national natural gas contingency plan covering the Maui gas platform failure
- development of a robust wholesale gas market should be a Government and NZES priority and be accelerated. Gas consumers would be able to improve the efficiency of their energy consumption if a gas spot market operated. One submitter noted they operate a spot market with customers benefiting from lower gas prices. A wider and deeper market could develop with appropriate signalling.
- More competitiveness in the sector was sought as gas supply contracts can be inflexible resulting in non-optimal gas utilisation and wastage.

Demand Side Response

Demand side management was supported by submitters from a wide range of sectors including local government, academia, environmental NGOs, interest groups, electricity and lines companies.

Demand management was seen as a key to reducing both emissions and reducing pressure on supply networks and has been underestimated in the NZES.

Energy efficiency and demand management could be more cost effective than new energy supply according to submitters from the renewable and interest group sectors.

The Electricity Networks Association (ENA) pointed out that line companies were incentivised to seek demand response to minimise investment in system reinforcement and transmission charge costs, and help manage load in real time while generator-retailers may actually be incentivised to maximise generation at times of peak price if they are long on generation.

It was noted that the Electricity Commission had work underway in the area of demand side management, how to facilitate demand side bidding and forecasting and work to determine the optimal load management infrastructure in New Zealand.

Demand Side Tools

Several sectors and individuals supported the introduction of smart meter technology along with pricing plans that enable customers to have control over the cost of their electricity.

Electricity and lines companies viewed time of use pricing as a very effective demand response tool. One submitted that prices should signal the marginal cost of supply and had removed all fixed charges except for their largest customers. Winter/summer pricing could be the minimum cost reflective tool that could be introduced. Day/night pricing was suggested by several individuals.

Ripple control was another useful demand side tool.

A range of mechanisms to promote demand-side energy efficiency/response were suggested by the academic sector, including smart metering and household electricity storage technologies. In particular they supported wider use of incentives and/or regulation to facilitate increased energy efficiency throughout the economy, with a particular focus on the residential sector where it is felt there is scope for cost-effective savings to be made.

Lines Companies Role

Line companies submitted their roles could be strengthened by:

- market arrangements giving line company's primacy in load management
- strengthened commercial signals to control line losses, with strong incentives to develop and protect load control investments.

Lines companies also commented that retailers often mute signals sent by lines companies. Making lines charges fully variable does send a signal that retailers can readily pass on.

It was noted that current regulatory controls on transmission pricing mean that locational signals are not accurately passed on.

Other issues

Some other issues and policy suggestions were:

- Concern about line companies not being obliged to supply electricity beyond 2013. NZES should recognise the environmental, social and economic importance of ensuring continuance of supply beyond 2013.
- NZES does not acknowledge the importance of water in meeting future growth in renewable energy. There are issues around maintenance of existing water rights and increasing competition for scarce water resources. Policy regarding allocation of water have implications for climate change and energy policy and should be recognised in the NZES.
- Large scale production of biogas as an alternative to natural gas was not considered in NZES. A working group was proposed to develop a biogas strategy, prepare feasibility study to assess the market and economics and construct a demonstration plant.
- It was suggested the chapter be renamed "Security of Energy Supply" recognising that other fuel sources, particularly gas and its direct use, have a role to play in security of supply.

Low Emissions Power and Heat

This section summarises some of the key concerns raised by submitters relating to the proposals to encourage low emissions power and heat. It commences with some general views and themes coming through submissions on the future electricity generation mix and approaches to transitioning to a lower emissions energy system. It then focuses on the Government's proposals.

A core part of those proposals is introduction of greenhouse gas pricing, and measures to facilitate the transition. Separate discussion papers were released on these issues. The summary of submitters views on Transitional Measures and climate change policy objectives and measures for post 2012 are the subject of separate reports.

Principles

There was some discussion from the environment interest groups on the principles that should guide the choice of short term policies to limit GHG emissions from electricity generation and industrial heat and power. The Sustainable Energy Forum, for example, suggests the following set of principles should guide the transition to a sustainable, low-emissions stationary energy system:

- invest in energy efficiency whenever this is more cost-effective than new energy supply
- recognise multiple benefits of local energy resources
- use “engineering efficiency” and “ecological efficiency” as the main criteria for assessing priorities for action
- invest in the transition towards sustainability
- fund low carbon policies
- focus research, development, and resource assessment on technologies and skills to achieve early results.

On meeting future electricity requirements

There were a range of views expressed by submitters on the government's climate change objectives for the electricity sector and its vision that all new generation should be renewable.

There was much discussion of what was needed for increased investment and development of renewable low emissions energy sources, on the energy mix and how the desirable mix (including growth of renewables) could be achieved.

Submitters, primarily from the electricity sector and business considered that appropriate price signals are the single, and most important, means of affecting future investment decisions in electricity generation. If the long run price of electricity includes environmental externalities the market will find the optimal level and type of generation with renewable generation operating on a level playing field with other forms of generation.

These submitters, with the exception of Meridian Energy, questioned whether 100% new renewable generation was possible in the medium term, often providing detailed analysis to support their contentions.

There was some discomfort, amongst electricity companies, with any approach that might prioritise renewable energy (and wind and geothermal within that category) over thermals, in that it involved the Government picking winners and opposed allowing the market, with the price of carbon internalised, to operate.

Other submitters, particularly those with interests primarily in renewable generation (wind and marine), strongly supported a 100% renewable generation future and considered it possible. They recognised that pricing carbon was an important step in encouraging the development of renewables. They noted however that it was unlikely to be enough to meet the government's climate change objectives and that a package of incentives, such as quota systems, mandatory renewable energy targets or feed-in tariffs, would be necessary.

Major energy users tended to support a diversified strategy where NZ continues to invest in generation from a variety of sources and all indigenous energy resources are exploited. Typical comments include:

- a full range of options should be available for supply of electricity to allow for price competitiveness
- all fuel/generating options need to be kept open so that NZ is positioned to rapidly adopt new technologies that will enable substantial emission reductions from fossil fuel sources
- Government should look at all different methods of generating power and invest in research and technology to allow the use of fossil fuels while minimising GHG emissions e.g. converting lignite to synthetic gases.

There was little support for a 100% renewable future from the fossil sector submitters. The cost and variability of renewable generation were factors against this scenario. Thermal generation, particularly gas fired plant, was needed to provide support for renewable generation. They expressed doubt that 100% new renewable generation will be economic, while 100% renewables can be technically done, this would be at a large cost to industry and greater than the emission savings. There were concerns that Government intervention may lead to higher electricity prices and windfall gains to investors in renewable generation.

Environment interest groups and many individuals supported a 100% or close to 100% renewables future. There were strong statements by some about the need to move to a system whereby remaining fossil fuel reserves are no longer required and are not extracted, that there was no role for coal, all new coal fired generation should cease and Huntly coal fired power station be decommissioned. Others recognised that back up fossil fuel capacity would be needed to offset natural fluctuations in renewable generation in the near to mid term.

Another noted that we need to leave our options open by not becoming reliant on a small range of energy sources and to allow for future technology that has the potential to reduce emissions from fossil fuels e.g. carbon capture and sequestration.

There was criticism from some regarding the sustainability of large scale hydro-electric generation which has significant and potentially irreversible environmental costs. The focus on renewables could put more pressure on for generation from this source.

Many individual submitters responding to the questions on the energy mix supported 100% renewable electricity, though also often recognised the ongoing need for thermal generation.

Streamlining regulatory barriers to new generation, was generally viewed by many submitters as a key area for government intervention. (see section on RMA and renewables).

Valuing low emissions energy

There was wide spread support from all sectors and from individuals that energy suppliers and other emitters should increasingly face the costs of the greenhouse gas emissions they produce.

There was a clear preference for a price based measure though differences in the preferred mechanism, its characteristics, the timing of introduction and whether other complementary policy options are required to encourage renewable development. Commonalities to coming through were:

- that any price based mechanism should be broad-based
- there should be strong links with international markets
- measures needed to be introduced while protecting the competitiveness of New Zealand industry.

A key area of divergence was around the timing of introduction of measures. Some stakeholders considered measures should be introduced without delay, others especially with concerns about competitiveness at risk continue to stress the importance of not moving ahead of our major trading partners.

Some stakeholder views are detailed below.

Comment from environment interest groups on carbon pricing both in the transition to 2012 and post 2012 was consistent. There were four key messages:

- a carbon charge/tax should be introduced as soon as possible as a transitional measure
- the charge must be broad based and cover all sectors, including transport
- commit to an internationally compatible emissions trading regime
- recycle any revenue from carbon charges into activities to achieve emissions reductions, energy efficiencies or to mitigate equity or fuel poverty issues.

Renewable energy companies (wind and marine) supported a broad based carbon pricing mechanism linked to international carbon prices. Pricing carbon would not however be sufficient to ensure that only new renewable energy is installed. There were issues around access to long term purchase agreements which affects market confidence in investment. It was suggested that a quota system, such as a Mandatory Renewable Energy Target would provide market stability. It was also noted that pricing mechanisms might not be sufficient

especially for small scale generation. Feed-in tariffs were suggested as the most effective way of supporting this form of generation.

Major energy users, supported broad based policies that deliver worthwhile reductions in GHG emission without forcing the loss of industries that contribute significantly to the NZ economy.

In the electricity sector there was broad support for the price of carbon to be built into the market. This needs to be linked to the international price of carbon. Some firms advocated for an integrated cross-Tasman emissions trading scheme.

Many companies wanted a charge across all emissions sectors. It was emphasised that the market failure to price externalities is not specifically in the electricity market issue. It is a failure to price emissions across all emitters.

There were divergent views within the sector on the timing of introduction of carbon pricing.

The number of companies favoured an early decision on carbon charging. They wanted credible action to lock in a carbon charging policy to provide policy stability. Contact believed that a full trading system could be achieved by 2009 using an NZX platform

There were divergent views on the need for transitional measures. One firm supported a hybrid proposal on the road to full emissions trading. This would start with a carbon charge across a narrow electricity and heat (above a threshold) basis and include NGAs, PREs and thermal generators purchasing emissions offset credits.

There was resistance to transitional measures from others in the sector. One advocated introduction of a price based regime when it could be applied equitably across sectors, when the international value was well defined and when this aligned with our major trading partners. Other incentives could be used for renewables in the short term. Another argument against transitional measure was that generation and transmission will occur ahead of any charge based on long term expectation of price.

The electricity sector strongly favoured emissions trading as the preferred option.

In terms of trading details it was suggested that an expert group design this so that any transitional measure is actually a final measure.

Submitters views on the details of any scheme varied. Some favoured cap and trade, and auctioning rather than grandfathering, possible free allocation to competitive-at-risk businesses and the allowance of banking and borrowing to stabilise value. They opposed any windfall gains tax. Others favoured grandfathering as the preferred allocation method. Meridian wanted an offset scheme linked to full emissions trading.

Some thought that if environmental externalities were priced, then revenues should be recycled back to remedy environmental effects.

Once emissions costs are internalised, the majority view of these stakeholders was that the market should be left to make decisions on appropriate investment rather than the government creating distortions through picking winners.

There was some support for the Projects to Reduce Emissions mechanism as a means of initial acceleration of renewable projects. A submitter noted that other measures may be

required at a later date after the first lower cost projects have been taken up to lift marginal projects over the investment hurdle.

Fossil fuel sector submitters had a range of views with the emphasis being that the carbon charge should not hurt New Zealand's international competitiveness. In common with electricity companies, and major electricity users they supported:

- cap and trade policy instrument in line with Kyoto Protocol and EU trading scheme. NZ should trade in the global market rather than establish its own
- measures to reduce GHG emissions should recognise international initiatives and not harm NZ economy and international competitiveness. A cost of carbon above our main trade competitors will increase our relative cost of energy and decrease the competitiveness of our major producing exporters.
- Greenhouse gas emission costs should be applied equally across the generation sector to encourage investment in thermal generation to help reduce emissions and meet electricity demand
- need a clear regulatory framework setting how the cost of GHG will affect electricity generators. Energy Strategy needs to clearly signal the cost of emitting greenhouse gases.

Triple bottom line accounting

There was little comment on this proposal.

Councils of Auckland region support triple bottom line reporting and seek consistency of reporting so major generators can be compared.

Fonterra supported mandatory reporting by major emitters as it:

- Would provide a better fact base for which to assess New Zealand's emissions and develop policy;
- is a prerequisite to responding to carbon footprint disclosure initiatives;
- is important for any emission trading scheme.

Distributed Generation

There is widespread support for the development of distributed generation (DG). Local Government considered it can contribute to security of supply and building community resilience in both urban and rural areas. A greater focus in the NZES on small scale local alternative generation and on-site systems which would create more certainty for remote areas was sought.

Distributed generation was seen by a Maori submitter as the way of the future for some communities. There was the need for more R&D and engagement with communities on this option. There was support for greater investment in renewable energy but only to the extent that new generation provides for Maori interests in those resources.

It is suggested by a number of respondents that more widespread application of DG could enhance security of supply and increase the proportion of energy generated from renewable

sources whilst reducing the need for large scale investment in new generation and the transmission grid.

Other advantages of DG were: reduction of CO₂ (renewables and cogeneration), peak load reduction (more so engine type than renewables), lower electricity losses, an increase in demand-side/consumer participation (depending on ownership). The goals for DG need to be clear, such as promotion of renewables and cogeneration rather than diesels for peak management. Line companies argue that their investment in DG can be used to assist dry year generation and at periods of peak demand to defer lines investment.

Other benefits of DG when compared with large central stations were:

- increased energy efficiency
- lower costs to electricity consumers (by reducing transmission costs and enhancing competition)
- contributes to a smart electricity system
- facilitates entry to the market by new players, and
- may be easier to finance if developers can spread risk over several projects rather than a single project.

Line company submitters and renewable sector submitters suggested that lines companies are inclined to invest in renewable generation (in contrast to large thermal stations) because of their size, cost and distributed nature. However they are currently constrained in their ability to invest in new generation and continue to advocate for greater freedom to invest in generation by removal of EIRA barriers relating to accounting and governance separation and effective capacity constraints.

Submitters considered there was a need for local generators to receive a portion of all local benefits. Suggested benefits include those from avoided carbon emissions, contribution to peak demand reduction at distribution and transmission level, avoided losses, the strategic benefit of having generation closer to load, and provision of more competition to the large generators.

It was pointed out that the benefits of DG are spread over a range of sectors. It was suggested consideration be given to aggregating these benefits somehow to create incentives for DG investors.

One submitter warned that encouragement of DG or embedded generation solely based on renewable energy resources to avoid GHG emissions is less likely to meet requirements for a secure long-term supply of electricity in NZ.

A submitter from the waste sector considered landfill gas electricity generation as a stable, reliable and consistent source of renewable energy providing multiple environmental benefits. Its potential should be discussed in the NZES.

Barriers to DG

Cost was seen as the main barrier to distributed generation by submitters from local government, environment organisations, the renewable energy sector and electricity and lines companies.

If the Government wants to promote DG then some form of intervention could be required to support a viable industry base. Currently DG suffers from the tyranny of scale. Without a critical mass and more certainty about market uptake supported by government initiatives there is little prospect for the emergence of a reliable DG industry.

It was noted that transmission infrastructure needs substantial improvement, both local transmission networks and the national grid, for DG to successfully contribute.

Other barriers to development include:

- cost of plant and equipment
- contractual and pricing arrangements for transmission and distribution
- price received for the generated electricity
- regulatory environment.

Cost of plant and equipment

The renewable energy sector submitted that the current cost of wind turbines makes it difficult for smaller projects, without economies of scale, to meet investment hurdle rates. Relatively fixed costs such as resource consents can also be prohibitive.

Contractual and pricing arrangements for transmission and distribution

Submitters noted price barriers that smaller scale generators face in order to get electricity to the grid. Currently there are no incentives for small scale generators to expand generation or sell excess capacity as the price to connect to the grid is prohibitive. Transpower's transmission pricing methodology has the effect of discouraging the establishment of DG in major load centres.

It is difficult for DG projects to realise the financial benefits of the reduced transmission and network losses and deferred network investments that they may help to create. If these financial benefits cannot be realised through regulation then an alternative "feed in" tariff mechanism may be appropriate.

Price received for the generated electricity

Currently, spot market prices are not bankable for small generators looking to fund their projects, and prices offered by generators are insufficient to justify investment. Low prices for generation offered by the major generators could in part be because small generators are in competition with the large generators.

Regulatory environment

Submitters considered that the regulatory environment has still some way to go before adequate levels of certainty can be achieved to facilitate an acceptable straight forward process for the initial stages of DG investigations. If it is too difficult and costly to negotiate

through regulatory hurdles, such as the RMA and council requirements, then DG investment will not occur. Anecdotal evidence suggests a very low rate of conversion of initial enquiry to generation. Some submitters suggested further work was required to reduce the consent burden for small scale projects.

Other comments were that presently transmission costs and grid losses are treated as "pass through" by lines companies so there is no incentive for them to invest in DG, current market opportunities for DG in general are limited and wide-scale realisation opportunities are unlikely to be economic. There is a trend for an increasing level of fossil based DG for load reduction in urban areas using diesel generators at peak times.

Submitters recognised the work currently underway on DG regulations. They noted:

- regulations should not be too cumbersome or it will hinder DG uptake
- there was too much emphasis on lines companies - barriers should be reduced for all generators
- the proposed regulations do not deal with grid connected DG
- regulations should be amended so generators are entitled to some or all of the avoided transmission costs
- proposed regulations do not provide sufficient incentives.

Way Forward

Several ways of supporting the uptake of distributed generation were suggested. These were:

- Feed in tariffs and the use of smart meters were commonly suggested to make the ventures economic. Under a "feed in" mechanism the electricity price obtained by lines companies for DG projects would be clearly defined and the expected rate of return would be transparent.
- Through Transpower's pricing schedules by:
 - (a) increasing the variable component (kWh or MW) .
 - (b) generators paying for all of the system or at least the variable component of the prices for the system.
- A minimum guaranteed price is needed to support investment into small scale generation

The emergence of electricity market agents who provide an aggregating service for small DG operators is a good sign. Once there are sufficient numbers of small generators in the network then a more competitive generation sector will emerge. This sector could also provide some of the ancillary services at a cheaper cost if the technologies for active networks were introduced.

Direct Use Heat and Power

Gas

Fossil fuel and electricity sector submitters noted that parts of the NZES focus on gas for electricity generation rather than an energy source in its own right, not recognising the efficiency benefits of direct use. This could result in electricity being substituted for gas for heating, more coal and light fuel oil being used in industry. Direct use of gas (DUOG) for heating is more efficient than using electricity generated at Huntly, for example, for the same purpose.

They considered NZES should endorse the direct use of gas as the lack of endorsement acts as a disincentive for investment and consumers to choose DUOG.

Solar

Solar heating was supported by Local Government, Consultant and Environmental NGO sector and many individual submitters. Specific comments included:

- extend the programme to provide financial incentives to encourage the uptake of solar water heating
- broaden government support for solar heating to include support for photovoltaic cells that can feed energy back into the national grid
- change the building code to require installation of solar heating. A consultant extended this idea by suggesting that regulations should be put in place so that every new house has to have a certain minimum area of solar collectors properly oriented and mounted.

Passive solar for space heating and cooling is the most cost effective use of solar but is not well recognised in building consent and design processes or by the householder. Effective bylaws need to be in place and enforced if passive solar is to reach its potential.

Wood

Environmental NGO sector suggested that focus was also needed on supplies of clean burning wood residues for home and industrial heating. An individual submitter suggested that biomass is underdeveloped particularly for direct heat applications.

A novel approach by one individual submitter suggesting research into the use of absorption systems for home heating and cooling using wood based heating source.

Waste Heat

Counties Power favoured development of initiatives to facilitate and encourage waste heat recovery in general for direct use.

Carbon Capture and Storage

There were mixed views around carbon capture and storage, some saw it as a way to continue to use fossil fuels and exploit New Zealand's indigenous resources (gas, oil, coal, hydrates, coal bed methane etc.) and reduce emissions, while others felt that the technology was still some way off, expensive and may not work in the long term.

In the future the gas market may benefit from new carbon capture technologies putting it on an equal footing with renewable energy. It may find a new life in ways not yet fully considered.

Some energy companies with fossil fuel interests noted that a necessary and effective contribution to the global response to climate change would be to expand incentives for and investment in, technology research, development and deployment, including Clean Coal Technologies. Carbon capture is expensive at present but an important element in the long term. Government should consider working with industry to implement fiscal changes to commercialise the technology as CO₂ capture and storage technology is one of the most promising options for mitigating emissions.

Another submitter said carbon capture will be an important facet in achieving carbon neutrality in the long term. Government should consider and implement legislative changes that are required to enable carbon sequestration to become a reality in NZ. Carbon capture and storage technologies may be closer to commercial application than other emerging technologies such as biomass based transport fuels or marine energy.

Others disagreed with a focus on carbon capture and storage as:

- companies in this area have sufficient funds to research this themselves
- New Zealand is too seismically active for this to be a sure solution
- it was more important to focus on energy efficiency and renewable energy source research, the FORST output class should be directed away from oil and fossil fuel related research
- it was an example of “picking winners”.

Environmental effects and the RMA

There were divergent views expressed by stakeholders on the operation of the Resource Management Act. Stakeholders who are applicants to the RMA (large and small renewable energy and fossil fuel generators, Transpower, and a few major users) continue to perceive the RMA as a barrier, despite recent reforms. These stakeholders tend to welcome initiatives to streamline and speed up the process but do not think a consolidated call in process is useful in this regard.

Major electricity companies in general recognise that the RMA is an appropriate framework for balancing of national interests against local effects and is reasonably sound but could be improved to make consent processes more timely, decisions more consistent and ensure that the wider interests of New Zealand are considered appropriately. Policy measures suggested were:

- amend section 6 of the RMA “Matters of national importance” to include electricity generation and associated infrastructure
- Provide national guidance under the RMA to achieve good sustainable management outcomes with regard to renewable energy and support the objectives and goals of the NZES. A National Policy Statement would provide guidance to local government and RMA participants, advisors, investors and decision makers. It would ensure, due to its statutory basis that consenting authorities give sufficient weight to implementing central government policy.

- Issues with non-compliance with time frames for resource consent processing. Suggests timeframes should be binding in nature and subject to sanctions for non fulfilment.

Establishing expert panels or boards to consider applications under the RMA were also advocated as a means to achieve a consistent approach to consent and to provide independent decision making. The mechanisms were noted as being similar to the independent commissioner role currently in place under RMA. Suggestions were:

- call-in future renewable generation projects to the Environment Court or a standing Board of Inquiry to speed up the process and promote consistency
- for Government to consider a power to appoint an independent and expert commissioner to council decision makers panels if this would assist
- a panel of commissioners to be appointed to hear applications that meet the requirements of the National Policy Statement and are of national importance.

While the sector recognised the importance of local input there were also suggestions that the process could be streamlined by restricting the right to submit (or be heard) to those directly affected, not allowing "in principle" submissions so old issues could be relitigated with every consent application and providing a voluntary mechanism for direct referral to Environment Court for complex or nationally significant projects be established.

Whole of government submissions were supported.

The sector did not support the proposed consolidated call-in process. They noted that the NZES was short on detail about its objectives and how it would work. Several companies considered, despite insufficient information, that there were risks associated with pooling applications.

Submitters with interest in wind and marine generation also supported assessment of projects by an expert panel on a case-by-case rather than consolidated basis. They stressed the need for a clearly defined non-political mechanism and supported maintaining a high level of local involvement.

Local Government considered the draft NZES did not focus on improving the use and understanding of the mechanisms already in place. They argue that the focus should be on making these work in order to get the right policy environment. There is a preference for national guidance under the RMA for renewable generation and improvements to regional planning processes.

It was acknowledged that the 2004 reforms have improved the ability of the local government sector to take account of national interests in the consenting process for renewable generation projects but more support and guidance from national agencies was needed to undertake this role effectively. It was suggested national support should assist councils to achieve more integrated planning processes and improve information, analysis and monitoring. Councils submitting independently suggest national support could take the form of information based tools for assessment of renewable energy projects or development of guidance, design standards and best practice for managing climate change issues.

There were mixed views on whether national guidance should take the form of a National Policy Statement for renewable generation. LGNZ was silent on the role of a National Policy Statement for renewable energy. Several councils supported it as a means of providing useful guidance, though localised effects need to continue to be managed on a local basis. Several councils did not favour a National Policy Statement for renewable electricity generation as it could become overly prescriptive and limit the ability of consenting authorities to take into account local circumstances.

LGNZ notes that local government can be constrained in fulfilling its role under the RMA and Local Government Act 2002 by lack of information about development strategies and the plans of energy developers. This can marginalise the role of councils “to a gatekeeper role at consenting stage of energy projects”. They suggest better integration of the long term plans of the energy sector into local government strategic planning processes would enable the RMA to operate more effectively.

Local Government suggested calling for expressions of interest in particular natural and physical resources could strengthen strategic planning processes which identify resource management objectives, policies, and rules that guide development and use of resources in local areas. It was noted that integrating energy developers’ plans into regional strategies could also lessen the adversarial nature of the consenting process.

Local Government was ambivalent about the merits of a consolidated consenting process, either favouring investigation into its merits or reserving a decision until there was more information available.

Maori submitters considered that it is important, especially in the push for increased wind generation, that cultural and social values of local communities are not undermined by building wind farms on land that has significant cultural value. Any attempt to weaken the community's ability to participate in resource management processes should be resisted. Call in procedures would put an onerous burden on some groups, such as Maori. There was concern that proposals would weaken or undermine Maori involvement in resource management processes.

Maori submitters also considered that present RMA legislation and Local Government Act should be changed to ensure Maori involvement as decision makers is required (currently legislation is permissive but this was said to be inconsistent with the Treaty partnership and does not ensure proper Maori representation). They also considered that the RMA model was still very reactive - local government needs better guidelines on how to integrate energy goals for the region relative to supply and affordability.

There was support from submitters with environmental interests for proposals for further national guidance under the RMA for renewables and climate change. It was seen as complementary to economic instruments and would help avoid uncertainty and inconsistency in decision making. Several submitters in this sector opposed any changes to RMA that would compromise the fundamental tenets of environmental integrity via a fair and accessible process. Another noted the RMA must not be changed to enable fast tracking of resource consents.

Major energy users sector were supportive of removal of RMA barriers to renewable energy development. EMA Central said that the fact that it is easier to get consent for thermal than renewable generation brings in to questions the fundamental concept that underpins the RMA. Stevenson Energy believes that RMA approvals need fundamental reform, that the strategy needs to consider water access rights, and expressed support for a streamlined consents process.

Other suggestions on regulatory issues were:

- progressing the draft Electricity Generation National Policy Statement which addresses the relationship between national and local interest
- ensure changes to the New Zealand Coastal Policy statement provide that wind turbines can be an appropriate activity in the coastal environment
- provide further guidelines on wind noise standards e.g. an National Environment Standard (NES) to cover noise emissions, vibration standards and related avifauna effects
- a NES be developed identifying performance standards for wind energy plant
- wind farming should be regulated as an appropriate activity in all places except National Parks and where it causes adverse effects as determined by national standards
- the NZES should consider how water access rights are to be addressed
- an NPS is required to protect the environmental values of fresh water and finite stock of rivers.

It was also suggested District and Regional Councils be directed through a NPS to designate land where wind power is a permitted activity. It was suggested that a certain percentage of land is allocated for wind farms as a permitted, controlled or discretionary activity. In a similar vein it was recommended a specific national site priority plan for wind farms be developed. A national wind location plan could indicate where compromises between wind energy requirements and local landscape and conservation values could be achieved;

Using energy more efficiently

Objectives/Direction

Submitters commenting on this section of the NZES almost without exception recognised the importance of energy efficiency measures in reducing energy costs, reducing emissions and improving security of supply.

There was some discussion of the weighting that these measures should be given in the NZES (and NZEECS) with suggestions that:

- there was too little emphasis on energy efficiency - it should be prioritised over increases in supply as efficiency achieves better environmental outcomes
- Energy conservation was downplayed in favour of energy supply and efficiency.

One submitter, from the academic sector, noted that the significant threats of climate change, required large reductions in emissions. For this to be met purely by innovation would require technological change at a rate never seen before. Breaking the link between economic growth and energy consumption was what was required. Reducing economic growth was not the preferred solution; the focus they considered needed to be on behaviour change.

Barriers to consumers improving efficiency were reluctance of consumers to fund the up front costs of energy efficiency improvements which have a payback over a number of years, lack of information, and insufficient skilled advisers and installers.

There was divergence in opinion on whether government leadership should be in the form of awareness-raising and provision of information, regulation or a combination of both.

One view was that policy measures targeted explicitly at the energy sector or specific technologies that will facilitate development of renewable energy will be more effective than attempts to restrict individual energy usage through policies aimed at energy conservation. In fact, it was noted, suppressing demand might have a perverse effect of slowing the growth of renewable energy sources, e.g. wind farms.

Major users and some other business groups considered there was no clear case established for intervention and that Government's role should be limited to provision of information as this was a barrier to uptake of energy efficient technologies and behaviour change.

Some submitters noted that different measures were probably required for individuals and households, small to medium businesses and large users.

Major energy users noted the limited potential for efficiency gains many in this sector noted they are operating at or near world's best practice. Some suggested price based mechanisms might be most effective driver for larger firms to reduce energy inputs per unit of production while having less impact on households.

Targeting

Several submissions suggested ambitious targets are required e.g. 20% reduction by 2020. Another noted New Zealand's past performance in energy efficiency has been 0.5% to 1%

pa, but that the NZEECS projects 1.5% to 2% improvement, at least double our previous performance. Given this, the final strategy needs to clearly demonstrate how energy efficiency targets are expected to be achieved, what specific measures will be introduced, who will be responsible for their delivery, and by when, and what remedial measures will be taken in the event that targeted savings are not achieved.

Low and fixed income earners

There was recognition that energy efficiency measures should be targeted initially at those least able to spend money on improved efficiency or energy supplies – the elderly and low-income earners.

Realising potential energy intensity reduction

There was criticism for some quarters of the figures in Table 5.1 – *Potential for energy intensity reduction*⁵. It was suggested that further investigation of the potential was required before being used to support sector specific interventions. The limited potential for industrial energy and emissions efficiency, in particular, was recognised in the Sustainable Energy Value Project (Covec 2006) and this should be given prominence rather than the projections given in NZES table 5.1.

It was noted the levels indicated in table 5.1 will likely require a massive shift in investment and prices and Government must be mindful of the economic and social consequences at measures aimed at forcing the economy to meet the targets.

Major users expressed concern that the strategy confuses energy efficiency with intensity. Energy intensity is not a measure of inefficient use of energy it instead means adding value to goods. Using the term energy intensity is misleading – it implies that the biggest gains can be made by heavy industry efficiencies. There was a feeling that the importance of energy intensive industry to New Zealand's economy was under recognised.

Major energy users, while generally supportive of energy efficiency proposals, want existing energy efficiency achievements acknowledged. Many firms are operating at word's best practise or close to it. Energy intensive industries continue to improve their technology to remain internationally competitive, often have energy efficiency plans in place including negotiated greenhouse agreements, and have strong incentives to reduce energy inputs. Government should recognise the record of energy intensive companies in energy saving.

One major user noted that several energy efficiency projects have not been undertaken as the payback is not economic, in these cases, incentives might be useful.

The National Energy Efficiency and Conservation Strategy

Detailed proposals for implementing the energy efficiency and conservation directions in the NZES were set out in the draft National Energy Efficiency and Conservation Strategy (NZEECS), released at the same time as the NZES. A number of submitters noted that

⁵ page 59, NZES

detailed submissions on energy efficiency measures were included in separate submissions on the draft NZEECS.

This report does not focus on the details of policy proposals in NZEECS, which is information most appropriately handled by EECA, it does however cover some of the key areas noted by submitters in their statements or in response to the questions posed.

Government Discount Rates

There were divided views on the proposals to adopt lower discount rates for cost benefit analysis of energy efficiency and other activities proposed in the strategy.

Those supporting a lower rate commented:

- that it is in accordance with their assessment of the discount rate using the marginal social rate of time preference method as well as tying in with broad objectives for promoting sustainable development
- in social cost benefit analysis the discount rate should reflect societal preferences. This contrasts with a private investment analysis where only the financial costs and benefits are considered using a discount rate based on the cost of capital of the firm
- higher social discount rates bias analysis against approval because longer term benefits are heavily discounted
- it reflects the long term benefits of renewable energy and energy efficiency measures
- noted the move still falls behind international best practice (some suggested applying the 3.5% rate adopted in the UK)
- it should be applied to assessment of grid transmission upgrade proposals.

Those not supporting the rate, primarily business interests, considered in a commercial environment it is common for a much higher discount rate to be applied by companies. Adopting an artificially low discount rate could establish how much Government is prepared to subsidise projects, rather than determining which project should be given priority.

There was some discussion of the proliferation of interest rates for assessing projects, the 10% Treasury default rate, 7% rate used by the Electricity Commission for the Grid Investment Test and the proposed 5% rate. It was suggested specialist advice on the correct rate should be sought and the outcome of the Treasury review of discount rates awaited. Justification for the rate chosen should be included in the strategy.

Several questioned how widely the rate would be used and noted it could have broader implications across the public sector.

Transit NZ commented that the move to a 5% discount rate could have the effect of redistributing government expenditure to energy efficiency and saving activities and away from other government portfolios. Implications for Transit could be:

- less funding being allocated to construction and maintenance of state highways
- a change in prioritisation within the 10 year State Highway Forecast as some projects would be assessed using 5% others 10%.

Promoting Energy Efficiency

Pricing mechanisms

There were mixed views on the extent to which pricing mechanisms alone will influence consumer demand for energy. Some submitters from the business sector considered that price signals alone, and the effective internalisation of externalities in prices would be sufficient to change demand. Some noted that price signals could be a stronger driver for large industrial users, unless industrial processes are uninterruptible.

Others supported a mix of measures particularly where behaviour change is difficult to deliver (often for households and small business).

Smart meters were in general supported as a means of raising consumer awareness of cost⁶.

One energy company advocated smart meters for all new homes. They went on to suggest the following targets:

- X% of residential buildings receive a 'smart pricing signal'
- Y% of commercial buildings receive a 'smart pricing signal' and
- Z% of new buildings have 'smart metering' installed.

One submitter provided a comprehensive study examining a series of energy efficiency investments that could potentially be financed by recycling revenue from a charge on GHG emissions. The study identifies smart metering as an early priority due to its ability to reduce demand directly and to facilitate additional savings when used in combination with other investments, including load management and distributed generation. The meters would cost around \$400 million and could be installed in all households over 4 to 5 years, using close to 90% local manufacturing content.

Several submitters noted that the provision of smart meters should not be mandated through regulation. The market is already operating with respect to adoption of smart meters with energy companies providing or considering providing smart metering services to gain competitive advantage.

Information and labelling

There was widespread support for Government initiatives promoting provision of information to consumers. There was recognition that lack of information about the benefits of energy efficiency was a barrier to uptake. Full information both at the point of sale and prior to sale while consumers were making buying decisions was important.

Incentives

There was widely based support for minimum performance standards for new capital stock where there were weak incentives for the market to deliver solutions with net public benefits. Support was frequently cited for:

⁶ Also see comments on demand-side response, page 39

- the current and proposed review of the building code
- a star rating system for homes and buildings to help make improvements more economically viable by creating capital value
- minimum energy efficiency standards for appliances.

It was noted that energy efficient building standards already exist in some countries. The 'PassiveHaus' or Passive House standard is one example. The costs of construction in Germany are competitive with conventional designs. Adoption of this standard for new homes would be a relatively inexpensive way to achieve the goals of keeping houses warm, improving the health of the occupants and greatly reducing energy use.

There was recognition that it was not always realistic to force updating of existing stock as cost was often a barrier. Incentives for retrofitting and extension of existing programmes for insulation and solar collectors were often cited as positive measures.

Improvements in health resulting from warmer homes were recognised as an important co-benefit of improved insulation. As such strategies to improve homes should target low income populations who are more likely to have poor health.

There was some support for introducing a requirement that prior to sale existing buildings be upgraded to present building code standards but also recognition that cost could be a barrier.

Commercial organisations, as noted above, said there are commercial incentives for efficiency improvements but enhanced minimum standards coupled with subsidies or tax incentives would help with installation of new or expensive technology.

Incentives were not however supported across the board with submitters noting that once climate change costs have been internalized all that might be warranted is information. One set of New Zealanders should not be taxed or levied to provide benefits to another.

Institutional arrangements – energy efficiency obligation

There were mixed views around the imposition of an energy efficiency obligation on energy suppliers.

Energy companies were almost unanimous in their view that a mandatory obligation to provide energy efficiency services was not called for. Many companies indicated their own initiatives in this area e.g. energy audits, home insulation, ecobulbs, respiratory health survey, carbon calculator. It was noted that energy efficiency services are already being provided without government support or leadership.

Other submitters against intervention noted that domestic and commercial energy users have economic incentives to improve energy efficiency, there were incentives on retailers to gain a competitive advantage by offering energy efficiency services, and that providing energy efficiency services was not electricity retailers core business – if compulsory it might not be well done. Positive incentives should be created.

Investigation of mandatory energy efficiency obligations on energy suppliers was supported by others on the basis that there were few incentives in a competitive market for firms to encourage reduced energy usage – private firms focus is the bottom line and maximising shareholder returns.

Others suggested it was a positive move as:

- it assigned responsibilities to agents with resources and capabilities to act
- high energy users and activities could be targeted
- it could mitigate public concerns about expansion of supply and transmission capacity often this has local effects that can not be mitigated
- incentives on vertically integrated energy suppliers to work with consumers on energy efficiency issues are currently weak.

Institutional arrangements EC & EECA

There was little comment generally in this area. Some energy companies noted however that dealing with both EECA and EC on energy efficiency initiatives was confusing and time consuming and advocate consolidation under one agency. One thought EECA should be the appropriate vehicle for delivering energy efficiency initiatives rather than EC.

Others suggested Government departments ensure there are no overlaps or gaps in policy design, implementation and accountability.

Other policy proposals

Other recommendations for policy included:

- Government investigating the barriers to commercial plant owners upgrading their capital plant to support energy efficiency improvements and possibly providing incentives e.g. accelerated depreciation
- Generate funds for energy saving through an Electricity Demand Fund
- require all state agencies to become carbon neutral including State Owned Enterprises
- establish Energy Savings Ambassadors to provide advice on energy savings to households and technical expertise to businesses
- instigate social research to understand how to change consumer behaviour and the impact of that behaviour
- use demonstration farms to illustrate efficient technologies in the farming sector
- many suggested incentives (subsidies or low interest loans) for a variety of energy efficiency improvements such as insulation, thermal blankets for hot water cylinders, energy efficient light bulbs, solar heating, and heat pump installation.

Sustainable Technologies and Innovation

Objectives/Direction

Framework for Research and Development

Two broad and competing themes emerged in submissions on the preferred approach for Government support for research and development. A number of research organisations, business groups and local government favoured a broad approach to developing low emissions, energy efficient affordable technologies that refrained from supporting some technologies over others. Others preferred direct government support for specific technologies.

Amongst energy companies, there was a strong view that technologies should be placed on a level playing field and that Government should not be picking winners. With this in mind Government funding of R&D initiatives should be on a contestable tender basis with transparent criteria.

Some energy companies had a strong market focus. Several thought that innovations would naturally flow from correct price signals within the market. The government has a role in ensuring that an attractive macroeconomic environment exists to encourage the necessary investment.

The key message from the research/academic sector is that particular technology solutions should arise as a result of research and innovation within the sector, rather than from government “picking winners”. There are risks of government selecting certain technologies for accelerated development in the absence of full information of their long-term benefits relative to other technologies. Technologies selected for accelerated development may not be those which could facilitate a step change in energy use.

The preferred approach is for the government to establish an environment that sets expectations for energy technologies and within which collaborative research and innovation is sufficiently resourced.

Other submitters supported the Government selecting priority areas for action. Comments included:

- renewable energy research needs special status with 100% government finance to worthy private sector projects
- wind turbine development in NZ should be aggressively supported
- research into wave and tidal power and offshore wind power generation is required
- solar photovoltaics and large scale solar power units had potential and should be supported
- geothermal energy has considerable potential through new techniques, e.g. ground source heat pumps, high dry rock technology for either heat or electricity
- the focus should be on the transport sector as this is the highest area of energy consumption

- focus on areas where New Zealand has a competitive advantage in technology e.g. agriculture
- cellulosic biofuel should be a priority for research and trial manufacture

Other submitters considered the focus should be on promoting and funding new sources of indigenous energy both fossil fuel and renewables and ways this energy can be harvested to minimise GHG emissions. Examples include carbon capture and storage for NZ lignite coals, biofuels extraction from forestry wastes and fuels grown from sewerage waste.

Taking a slightly different slant, another submitter said New Zealand R&D should be judged against the potential contribution not only to NZ but its wider economic and social needs. In table 6.1, they noted, there is no attempt to address areas where NZ could:

- have significant impact on the global problem of climate change through science
- engage in a commercially lucrative exporting of technology, even though there is little impact on our own energy needs.

Others suggested, in a similar vein, that there was too much focus in the NZES on being a fast adapter. The strategy should also recognise more opportunities for New Zealand led innovation.

Whole of life cycle approach

Some councils and research companies commented that a “whole life-cycle” approach should be taken. Support is needed from primary research through to actual commercialisation. Government needs to consider and have active involvement in the full R&D process from desktop research, through to commercialisation. Areas where activities are currently lacking are said to be in pre-commercialisation and demonstration of new energy technologies. Often new technologies need a “push” to get them to the development and commercialisation stage.

This view was disputed by others who favoured funding for research into technologies that had evolved sufficiently to suggest they may become commercially viable in the near-term. For example, carbon capture and storage technologies may be closer to commercial application than other emerging technologies such as biomass based transport fuels or marine energy.

Funding

Many submitters supported increased funding for research and development and extensions to criteria for funding eligibility. Comments and suggestions included:

- Increase R&D funding and recognise that New Zealand could be a technology adapter so some money needs to be directed to picking up overseas research and adapting this to NZ conditions. As such, this requires some funds to move outside pure R&D into more applied areas.
- A key factor to increasing expertise requires dramatically increased funding in useful energy research. Many scientists have moved from this area because of the lack of funding.

- Funding should be extended to commercialisation and evaluation and investigation of early adoption of overseas technologies.
- Greater access to public research funds for applied service providers is needed.
- The government establish a contestable process for obtaining high levels of funding for projects which would, deliver sustainable, innovative, cost effective and appropriate new energy efficiency technology or products, provide sound comparative information relating to the new technology or product and have gained the support of the industrial or commercial stakeholders to which the project relates.
- An energy company suggested that if there is allocation criteria, one of these could be based on the degree of emissions reduction that could result from the development of a particular technology.

Private and public sector leadership

There was some comment that the current research funding environment leads to competition, rather than collaboration, amongst researchers.

Collaboration between universities, Crown Research Institutes, and industry, and other technology partnerships, were recognised as central to a successful energy R & D strategy. There were benefits to be derived from breaking down of knowledge silos and promoting research networks. Clear governance arrangements and appropriate membership including those with a direct interest in the research were cited as important to success.

Technology partnerships are central to a successful energy strategy. They also depend upon government providing certainty of policy direction, a level playing field and flexibility for the methods to achieve these solutions. The Australian COAL21 plan is an example of a government /industry partnership to encourage the transition to low emission technology.

Major energy users were supportive of public/private technology proposals as technology transfer is the key to long-term emissions reductions, NZ cannot meet its objectives without the adoption of emerging technologies, and global adaptation relies on significant technological breakthroughs.

It was noted that in the research arena there is competition between public and private organisations for intellectual property. This can present a conflict of interest particularly when a private company seeks assistance from a public research organisation which may be competing in the same area. There could be a need to set some protocols to govern this competitive field.

Increasing capabilities and co-ordination

Sustainable energy research and education centre

Comment on the proposal to establish a new sustainable energy research centre was generally positive. There was recognition that coordination of NZ energy research through a central point was desirable and could assist in building strengths in energy research. Some considered it should not be limited to sustainable energy but act as a forum for discussion of energy research across the whole energy sector. Suggestions included:

- creation of a NZ Energy Research Institute (NZERI) seeded around one of the existing national centres of excellence
- supporting the University of Otago's proposed National Energy Research Institute
- establishment of a central research agency with major industry and crown agency representatives building on the current Pastoral and Greenhouse Gas Research Consortium model
- supporting the energy research alliance as a nucleus around which coherent energy research could develop.

Another suggestion for linking information and improving information flows was that Government agencies should arrange regular forums where representatives from various renewable energy fields can meet to discuss future innovation opportunities.

Research organisations emphasised the need for research and teaching programmes to be strongly linked to improve capabilities and develop skills.

Strengthening international linkages

It was recommended NZ needs to maintain strong international links to maximise uptake of technology that has been developed elsewhere.

There was support for:

- joining overseas renewable energy organisations such as the International Energy Agency (IEA) Ocean Energy Systems Implementing Agreement and rejoining the IEA wind energy agreement
- closely monitoring overseas tidal energy development
- monitoring and improving international linkages to enable fast adaptation of emerging technologies.

Accelerating innovation

Some submitters suggested the Government needs to encourage private sector involvement in energy-related R&D and uptake of emerging environmental technologies by way of tax incentives, capital grants and subsidies.

Marine Energy

There was qualified support for a fund for marine development from local government but concern that this alternative promising technology has been singled out over others and a suggestion that the contestable fund should be widened to cover all aspects of renewable energy production and distribution.

Submitters directly involved in marine research and development were in support. They noted that marine energy technologies, deployments, operations and maintenance are not so advanced overseas; it is unlikely that there will be one dominant design for wave and tidal energy devices and there are significant opportunities for intellectual property development in NZ, which could lead to a domestic and export market.

They advocate that the marine energy deployment fund should be inclusive of demonstration projects. Consideration also needs to be given to how to promote early commercial marine projects as they are unlikely to be competitive except in some niche applications.

It was suggested a marine energy centre should be established. The centre could establish trial development sites, offer certification facilities and a focus for research, not only into devices but also into their environmental impacts.

Other submitters opposed establishment of a marine energy centre as there are surplus test facilities in UK/Canada, it would require ongoing capital and overheads, there are minimal technologies to be tested and no site suitable for both tide and wave. Funding that was available in New Zealand should be diverted to encourage adoption of successful technologies here or to support overseas test facilities.

Another view was that the Marine Energy Deployment fund should be for deployment only and be larger to increase its credibility.

Some groups did not support the marine fund as it was not evident that the benefits of the funding were determined through a contestable process. Funding should be sought through the established MORST bidding process.

Other policy recommendations

Other recommendations for policy included:

- research into home energy use and issues such as "fuel poverty" being carried out by such institutions as the Otago Energy Research Centre needs to be monitored by relevant government agencies
- the resource consent process should be minimised for small and experimental projects
- a crown investment fund targeting equity positions in new technologies be established
- building capacity for long term energy systems modelling and scenario building
- a marine energy strategy be developed.

Affordability and Wellbeing

There was recognition from consumer groups, interest groups, local government and business groups that the variable impacts of policies, and affects of any price rises, on various economic groups needs to be considered and mitigated.

Fuel poverty was recognised by some as a growing problem. Many submitters, especially individuals, supported energy efficiency measures that reduce energy usage and improve living conditions being targeted at those least able to pay. Other submitters suggested targeted income support policies be used to ensure ongoing affordability for consumers on low incomes.

One submitter thought externality pricing should not adversely affect the issues of affordability and fairness, with recent wholesale price movements being far greater than any discussed increases due to carbon pricing.

There were suggestions that revenue raised through any carbon charges could be recycled to support subsidised measures.

Household heating, lighting and cooking

Electricity- avoidable disconnection

There was general support from energy companies for the Electricity Commission initiatives relating to avoidable disconnection. Some noted more information on energy efficiency practices and technologies was needed. Electricity retailers noted:

- there were comprehensive processes to manage disconnection in place
- they are actively involved with the Electricity Commission to assist low income consumers
- retailers could help by providing referrals to social agencies
- clear and reasonable credit policies should be in place
- taking on higher credit risk would result in higher prices
- only a small percentage of consumers result in disconnection and the EC initiatives are enough to assist with this
- disconnection should be a measure of last resort.

Low Fixed Charge Tariff

Local government and several others submitters endorsed improvements to the low fixed charge regulations to take into account regional climate variations. This would provide relief to some people. A submitter noted it could leave many wanting and suggested government review inverse step tariffs for domestic consumers to provide further relief.

Energy suppliers commenting on this area cited the Government's Low Fixed Charge Tariff policy as an example of poorly considered policy that misses the mark in that it supports high income low energy households while it penalises poor, large families. One said changes could result in cross-subsidisation and increasing the LFCT level was inconsistent with

energy efficiency proposals. One company favoured a change to the average consumption level to be based on network areas rather than an arbitrary geographical line across NZ.

Major users noted that it was distortionary because of variable sunk fixed line costs and that the regulations should be repealed.

Mobility

Local Government reiterated the need for Government to take a more active role in development of sustainable urban form and transport infrastructure. LGNZ requests Government establish a partnership with them to progress planning for the future. There is an opportunity to update and directly tie the Urban Design Protocol to energy policy or to develop a sub-strategy on the theme of urban form and functionality in a broader context.

This view was supported by a range of other submitters. The implication for land use and integrated transport planning are discussed in more detail in the chapter on low emissions transport.

Another concern of submitters was that the term mobility should be replaced with accessibility – accessibility implies access to services and localities but does not necessarily require or imply increased travel.

Making informed energy decisions

Comment on information on energy options was limited and views on whether there was adequate access to information were mixed. Individuals suggesting more information was needed tended to favour use of the media. Other submitters cited useful websites - low cost information services currently available. These submitters tended to reject more extensive information services and favoured suppliers and intermediaries providing information.

Other initiatives for low income earners

Those responding to the question on this issue frequently cited initiatives to improve insulation especially in older homes as a high priority measure.

Maori submitters noted that EECA's programmes for retrofitting insulation into low income houses is of limited impact in Maori communities because it requires a great deal of local coordination to access the funding, the application process is long and involved. There needs to be greater help in accessing these programmes.

Other Matters Raised in Submissions

Advocacy

Grey Power recommended an officially recognised and properly funded consumer advocacy organisation be established to ensure the interest of individuals and households and small business are properly considered.

Maori capacity for engagement was also limited and needs support. Suggest establishing a National Maori Forum to facilitate and coordinate strategic iwi engagement which would be the single point of coordination i.e. dispense with variety of mechanisms in use.

Partnership central/local government

Local Govt New Zealand, and many councils in there individual submissions, seek greater recognition of local government's role in implementation of the NZES. Identifying relationships between national goals and local authority roles will make the strategies more effective in practice and provide guidance for local government implementation, particularly as there are a number of areas within the NZES and NZEECS which are significantly controlled by local government. Consideration needs to be given to how this relationship between central agencies and local government might operate in practice.

Some councils noted that they have or are in the process of developing Sustainable Energy Strategies and regional energy strategies for their districts. These contain action plans for the local communities. Christchurch City Council, for example, notes that national energy strategies could succeed if they relate to and collaborate with local/regional strategies. The national strategy has failed to take the potential of local strategies into account.

Capability building & skills

Councils are looking for tangible support from Government in regard to implementation of energy issues, including support for training, direction, guidance and funding.

Other submitters noted skill shortages and lack of expertise in the area of energy efficiency services, in constructing new technologies, in the technical and engineering skill-base, in the building, architectural and engineering trades on solar and other energy efficient devices. Work needs to commence now to develop skills where shortages exist or are likely. Some suggested the strategy should explicitly support the growth of the technical/engineering skill base, perhaps by direct support to education and training providers.

On workforce issues it was also suggested that the Labour Department analyse and monitor the effects of the strategy on employment.

A tertiary institution recommended that Government consider the best way of fostering tertiary institution leadership in sustainability issues. Tertiary institutions can provide leadership on sustainability issues through:

- educational programmes and curricula
- research capabilities
- their own sustainability initiatives.

Role of Lines Companies

The Electricity Networks Association believe that the potential role of electricity networks in terms of security of supply, demand side response, the RMA, distributed generation and, critically, delivered energy prices has been overlooked in the NZES and broad government policy frameworks. They can reduce supply interruptions as part of the supply chain through efficient network operation, price signals to consumers, reducing consumption within a network area and reducing national generation needs. Line companies are specifically required to engage with the consumer on cost/reliability trade-offs and hold information on this, in contrast to retailers who are one step removed from the consumer. Lines companies through effective management of networks in real time can ensure dynamic adaptation to changing energy requirements e.g. electrification of Auckland rail.

Consultation process

Process to date

Views were mixed on the NZES consultation process to date. Some submitters were positive about consultation to date and request an ongoing dialogue and engagement as policy development progresses.

Many submitters were less positive about the process – there were too many discussion papers at one time (the five climate change documents), the consultation period was not long enough and considerable prior knowledge was required to tackle the information. The general public was alienated by these factors and a lack of information as to how they would be affected. Submitters commented the format of the NZES was intimidating for many. Another criticised the way the questions were phrased and noted that they did not identify problems involved in implementing various government policies or provide submitters with a way of adequately expressing views.

Maori seek a better process for the consultation and sufficient time to participate. They suggest it is prudent to have tangata whenua involved from start of the policy development process and also engaged in implementation. More Maori staff at a senior management level within agencies are needed as they tend to prioritise working with Maori, are more accessible, more responsive to the obstacles to Maori involvement and able to ensure that research with a Maori component is carried out. It was suggested a Maori endorsement protocol be introduced prior to any papers going to Ministers/Cabinet.

Others thought more industry engagement in policy making is required and the basis for policy recommendations should be more clearly set out. Further advice on regulatory options was needed including net benefit analysis and a regulatory impact assessment. Another complaint was that it is not clear from the strategy document how submissions are to be taken into account and how the detailed implementation of the strategy is to be agreed and finalised.

Structure of the energy and climate change discussion documents

Some submitters questioned the need for two documents – the NZES and NZEECS and suggested they be merged and the Energy Efficiency and Conservation Act be amended to

enable the statutory process of developing a replacement NZEECS to apply to a final New Zealand Energy plan.

Suggestions for improvements to the final strategy included stronger language, more specific actions, a prioritisation schedule for the short, medium and long term, a summary table of what might be achieved and by when.

It was suggested Government should provide a summary document explaining the whole of Government approach to climate change and energy issues.

Some submitters viewed the integration of strategies for stationary and non-stationary energy as problematic. The issues for these sectors differ significantly with energy being sufficiently important for a strategy in its own right and transport issues covered by the New Zealand Transport Strategy or another document.

Another round of consultation

Absence of specifics and analysis and the significance of some of the decisions to industry and the economy as a whole prompted some to suggest there should be another round of consultation, particularly once the cost benefit analysis, assessment of trade-offs and the government's final preferred package have been agreed.

APPENDIX LIST OF SUBMITTERS

- 001 Jono Conway
- 002 Urban Step
- 003 F.T. Walker
- 004 Greg Plowman
- 005 None supplied
- 006 Ben Nistor
- 007 Ceri Warnock
- 008 Richard Croad
- 009 Chris Barry
- 010 Margaret Kempton
- 011 Vincent Gray
- 012 Allan Parker
- 013 Michael Cooper
- 014 IT-Mondial Pty Limited, IndraNet Technologies Limited
- 015 Jon Olson
- 016 Employers and Manufacturers' Association (Northern) Incorporated
- 017 HYDRA Software Limited
- 018 Michael D. Malloy
- 019 Tourism Industry Association New Zealand
- 020 United Future New Zealand
- 021 Peter Raikes
- 022 Peter Ballance
- 023 Paul Wood
- 024 Russ Dawson
- 025 Bryan Walker
- 026 Friends of the Earth
- 027 Chas Tanner
- 028 Colin Prouse
- 029 Suzi Phillips
- 030 Terry Wall
- 031 Genatron / Datamatrix

- 032 Maritime New Zealand
- 033 John Hudson
- 034 John Wilson
- 035 Luis Vildosola
- 036 Cliff Turner
- 037 Bill Macky
- 038 Joachim Rauhut
- 039 Roseanne Burleigh
- 040 Richard Pickering
- 041 Glynn Babington
- 042 Dr Susan Krumdieck and students, University of Canterbury
- 043 Dr Susan Krumdieck, University of Canterbury
- 044 Baker Postelnik
- 045 Fisher & Paykel Appliances Limited
- 046 Auckland Regional Public Health Service
- 047 Russ Dawson
- 048 Wellington City Council
- 049 Dr Jill Hamel
- 050 Urs Blum
- 051 Taranaki Regional Council
- 052 James Bryant
- 053 Julia Shaw
- 054 Kylie Robertson
- 055 Regan Edwards
- 056 Charles Deverish
- 057 Jess Wong
- 058 Dr Nick Wilson
- 059 Geoffrey W.J. Hinds
- 060 Western Bay of Plenty District Council
- 061 Dr P.M. Wallis
- 062 Neil Going
- 063 Christchurch City Council

064 MG Car Club (Wellington Centre) Incorporated and MG Classic Motor Racing
065 New Zealand Clean Energy Centre
066 Clive Sparrow
067 Franklin District Council
068 King Country Energy Limited
069 New Zealand Post Limited
070 Christine Henderson
071 Claire Pascoe
072 Duncan Wright
073 Mark Newton
074 Phillip Barker
075 Terra Dumont
076 Willem van de Veen
077 Northland Regional Council
078 Sustainable Energy Forum
079 Democrats for Social Credit
080 Green Zephyr Co Limited
081 International Association for Natural Gas Vehicles
082 International Pacific College
083 Major Electricity Users' Group
084 New Zealand Shipping Federation Incorporated
085 New Zealand Steel
086 Bill Duncan
087 Brian Turner
088 Dr John Horrocks
089 Ken Mitchell
090 Dr Mike Patrick
091 Te Rūnanga ā Iwi o Ngāpuhi
092 Upland Landscape Protection
093 Venture Southland
094 Wind Farm Group
095 Blakeley Associates Limited

- 096 Clean Air Society of Australia and New Zealand
- 097 Dairy Companies Association of New Zealand
- 098 Earl Bardsley, Department of Earth and Ocean Sciences, University of Waikato
- 099 Dr Inga Smith, Department of Physics, University of Otago
- 100 Employers and Manufacturers Association (Central) Incorporated
- 101 Far North District Council
- 102 Far North PermaCulture Group - Kohumaru Compost Collective
- 103 Independent Electricity Generators Association
- 104 Local Government New Zealand
- 105 Mainpower New Zealand Limited
- 106 Nelson City Council
- 107 N.L. and C.E. Wensley
- 108 Bill Sayer
- 109 Brian Robert Sandle
- 110 D.H. Tucker
- 111 D Ian Matheson
- 112 David MacClement
- 113 David Painter
- 114 Dr Desmond Darby
- 115 Dr Garry Carr
- 116 Dr Pat Neuwelt
- 117 Jackie Dee
- 118 Jamie Hosking
- 119 Judi Candy
- 120 M.L. Webb
- 121 Mike Camden
- 122 Roger Best
- 123 Sarah Sutherland
- 124 Viola and Phil Palmer
- 125 New Zealand National Committee of the International Institute of Refrigeration Incorporated
- 126 Oceana Gold (New Zealand) Limited
- 127 Odyssey Energy Limited

- 128 Maria Callau, Physics Department, University of Otago
- 129 Rinnai Gas Appliances Limited
- 130 Road Transport Forum New Zealand
- 131 Solar Action
- 132 Southland Chamber of Commerce
- 133 Tauranga City Council
- 134 Bob Lloyd, Department of Physics, University of Otago
- 135 Ralph Chapman and Jonathan Boston, Victoria University of Wellington
- 136 Wanganui Gas Limited
- 137 Winstone Pulp International Limited
- 138 Winstone Wallboards Limited
- 139 Wood Processors Association of New Zealand
- 140 Allco Wind Energy
- 141 Alliance Group Limited
- 142 Aotearoa Wave and Tidal Energy Association
- 143 Arc Innovations Limited
- 144 ASPO-New Zealand Incorporated
- 145 Councils of the Auckland Region
- 146 Autonomic Consulting Limited
- 147 Ballance Agri-Nutrients (Kapuni) Limited
- 148 Beacon Pathway Limited
- 149 Biojoule Limited
- 150 BP New Zealand Limited
- 151 BRANZ
- 152 Business New Zealand
- 153 Campaign for Better Transport
- 154 Canterbury Employers' Chamber of Commerce
- 155 Canterbury Manufacturers' Association
- 156 Carter Holt Harvey Limited
- 157 Central Otago District Council
- 158 Chevron New Zealand
- 159 Climate Defence Network (New Zealand)

- 160 Contact Energy Limited
- 161 Counties' Power Limited
- 162 CRL Energy Limited
- 163 Dr David Wardle, Department of Physics, University of Auckland
- 164 Dunedin Vegans Group
- 165 Earnslaw One Limited
- 166 Electricity Engineers' Association of New Zealand Incorporated
- 167 Electricity Networks Association
- 168 Bart van Campen, Energy Centre, University of Auckland Business School
- 169 Enerstore Consulting Limited
- 170 Environment Canterbury
- 171 Environment Bay of Plenty
- 172 Environment Southland
- 173 [duplicate submission]
- 174 Environment Waikato
- 175 Environmental Defence Society
- 176 Paule Stephenson, Faculty of Engineering, Kingston University
- 177 Far North Environment Centre
- 178 Federated Farmers of New Zealand Incorporated
- 179 Fletcher Building Limited
- 180 Forum for Auckland Sustainable Transport
- 181 Foundation for Arable Research
- 182 Gisborne Environmental Centre Incorporated
- 183 GNS Science
- 184 Greenhouse Policy Coalition
- 185 Grey Power Federation
- 186 Greymouth Petroleum
- 187 Global Climate Change Consultancy
- 188 Hamilton City Council
- 189 Industrial Research Limited
- 190 IPENZ
- 191 Kensington Swan

- 192 Land Transport New Zealand
- 193 Living Streets Aotearoa
- 194 LPG and Gas Associations
- 195 Makara Guardians Incorporated
- 196 Manukau City Council
- 197 Marlborough District Council
- 198 Marlborough Lines Limited
- 199 Maunsell Limited
- 200 Meridian Energy Limited
- 201 Methanex New Zealand
- 202 Ministry of Health
- 203 Motor Trade Association Incorporated
- 204 National Energy Research Institute
- 205 Neptune Power Limited
- 206 New Zealand Institute of Forestry
- 207 New Zealand Minerals Industry Association
- 208 New Zealand Refining Co Limited
- 209 New Zealand Wind Energy Association
- 210 NEXUS (Auckland University's Student Sustainability Group)
- 211 NIWA
- 212 Andrew Old
- 213 Bera MacClement
- 214 Bryan Leyland
- 215 Chayne Zinsli
- 216 Chris Curlett
- 217 Dr Graeme Lindsay
- 218 Frank Lewis
- 219 Graeme Easte
- 220 Ian Goldsmith
- 221 Jenny Campbell
- 222 John Monro
- 223 Katy Brown

- 224 Liam Smith
- 225 Mark Payne
- 226 Mark Roberts
- 227 Mathew McCallum-Clark
- 228 Michael Cambridge
- 229 Michael Nudds
- 230 Murray Grimwood
- 231 Paul Bieleski
- 232 Paul Henson
- 233 Peter Smeaton
- 234 Susanne Montgomerie
- 235 Tara Ross-Watt
- 236 Norske Skog Tasman Limited
- 237 New Zealand Automobile Association
- 238 New Zealand Business Roundtable
- 239 Scott Caldwell, New Zealand Centre for Advanced Engineering, University of Canterbury
- 240 New Zealand Council for Infrastructure Development
- 241 New Zealand Council of Trade Unions
- 242 New Zealand Geothermal Association
- 243 New Zealand Historic Places Trust
- 244 New Zealand Recreational Canoeing Association
- 245 New Zealand Windfarms Limited 2007-03-30
- 246 Oamaru Whitestone Civic Trust / Waitaki First Incorporated / Otago Fish and Game Council / Central South Island Fish and Game Council / Otago Branch, New Zealand Salmon Anglers Association / New Zealand Federation of Fresh Water Anglers Association
- 247 Ocean Energy Innovation Limited
- 248 Office Solvent Rescue
- 249 OMV New Zealand Limited
- 250 Orion New Zealand Limited
- 251 Otago Conservation Board
- 252 Otago Fish and Game Council
- 253 Oxfam New Zealand
- 254 Pacific Institute of Resource Management

- 255 Pan Pac Forest Products Limited
- 256 Taharoa C Incorporation
- 257 Pioneer Generation Limited
- 258 Plastics New Zealand
- 259 Powerco
- 260 PowerNet Limited
- 261 Resident's Action Group for the Environment Society Incorporated
- 262 Ian Luxmoore, Resource and Environmental Planning, Massey University
- 263 Rio Tinto Aluminium (New Zealand) Limited
- 264 Roaring 40s
- 265 Royal Society of New Zealand
- 266 Save Happy Valley Coalition
- 267 Richard Gardner, University of Auckland
- 268 Southland District Council
- 269 Strata Energy Limited
- 270 Students for Sustainable Transport, Auckland University
- 271 Sustainable Dunedin City Society
- 272 Sustainable Electricity Association New Zealand Incorporated
- 273 Sustainable Future
- 274 Taranaki Energy Watch
- 275 Tasman District Council
- 276 Taupo District Council
- 277 Te Rūnanga o Ngāti Porou
- 278 Te Rūnanga o Te Rarawa
- 279 [duplicate submission]
- 280 The Petroleum Exploration and Production Association of New Zealand
- 281 Transit New Zealand
- 282 Transpower New Zealand Limited
- 283 Trip Convergence Limited
- 284 TrustPower Limited
- 285 URS New Zealand Limited
- 286 WEL Energy Trust

- 287 WEL Networks Limited
- 288 New Zealand Chambers of Commerce
- 289 Westland Milk Products New Zealand
- 290 Whaingaroa Environmental Defence Incorporated
- 291 Wind Prospect New Zealand Limited
- 292 Windflow Technology Limited
- 293 Wood Council of New Zealand
- 294 WWF New Zealand
- 295 Dunedin Branch of the Green Party of Aotearoa
- 296 Elliston Power Consultants Limited
- 297 Kevin Burke
- 298 Rod McDonald
- 299 Don Cleland
- 300 Crest Energy
- 301 Ecologic Foundation
- 302 Energy Federation of New Zealand
- 303 Lunar Pacifica
- 304 Peter Read, Massey University Centre for Energy Research
- 305 Meat Industry Association
- 306 Michael D. Malloy
- 307 Peter Baker
- 308 Sean Cox 2007-04-02
- 309 New Zealand Seafood Industry Council Limited
- 310 Stevenson Group of Companies
- 311 Te Mana Taiao Environmental Trust
- 312 Te Pumautanga o Te Arawa Trust
- 313 Vector Limited
- 314 Bus and Coach and Rental Vehicle Associations (New Zealand) Incorporated
- 315 Kaikoura District Council
- 316 Origin Energy
- 317 Auckland Regional Transport Authority
- 318 Fonterra Co-operative Group Limited

- 319 Gas Industry Company Limited
- 320 Genesis Energy
- 321 Solid Energy
- 322 Todd Energy Limited
- 323 Futures Committee of the Religious Society of Friends (Quakers)
- 324 Mighty River Power Limited
- 325 David W.H. Berry
- 326 New Zealand Business Council for Sustainable Development
- 327 New Zealand Fish & Game Council
- 328 RES New Zealand Limited
- 329 Shell New Zealand Limited
- 330 Environment and Conservation Organisations
- 331 Key Energy Limited
- 332 Coal Association of New Zealand
- 333 Dave McArthur