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Powering Our Future – Towards a sustainable low emissions energy system; draft *New Zealand Energy Strategy to 2050*

Submission to the Ministry of Economic Development (MED)
30 March 2007

Background to IPENZ

The *Institution of Professional Engineers New Zealand* (IPENZ) is the lead national professional body representing the engineering profession in New Zealand. It has approximately 10,000 Members, including a cross-section from engineering students to practising engineers to senior Members in positions of responsibility in business. IPENZ is non-aligned and seeks to contribute to the community in matters of national interest giving a learned view on important issues, independent of any commercial interest.

Executive Summary

IPENZ strongly supports the development of a National Energy Strategy (NES) and considers that a comprehensive strategy is essential in order to maintain a secure and economically viable energy supply for New Zealand.

IPENZ considers that it is appropriate to use a research-informed risk-management approach to develop and implement an energy strategy. In order to be effective, the actions selected must have demonstrated net economic benefit, target minimum life cycle costs for consumers, and provide certainty for those making energy-related decisions.

IPENZ considers that the essence of a suitable New Zealand Energy Strategy can be defined via a set of premises, technology propositions and principles, and all policy actions must be consistent with them. We have outlined them below, and also responded more specifically to the draft strategy.

Our major concern with the draft NES is that there is a lack of recognition of the impact that transformational technologies are likely to have. Such technologies could produce a paradigm shift in how we use and produce energy in New Zealand, rather than the incremental approach which the draft seems to suggest. The NES needs to be much more ambitious in recognising the likely impact such technologies will have, and the need to prepare for their uptake.

We are happy to meet with the Ministry to further discuss any of the points raised in this submission.

Submission

Premises, propositions & principles

IPENZ considers that the essence of a suitable New Zealand Energy Strategy can be defined via a set of premises, technology propositions and principles, and that all detailed actions must be consistent with them.

- The appropriate approach, both in terms of ongoing security of energy supply and long-term sustainability (including movement towards a carbon-neutral economy), must be based on risk management.

- The weight of scientific opinion on climate change blames human activities but this is not yet proven. While New Zealand may wish to demonstrate leadership on global issues, risk management analysis suggests that it would be unwise to move significantly ahead of the rest of the world by undertaking actions that are not otherwise economically reasonable, or that cannot be justified by a risk:benefit analysis that considers only the New Zealand context.

- Very worthwhile gains can be made by energy efficiency and conservation measures that target minimum life cycle costs for consumers (ie achieve the lowest possible total cost over the full life cycle of the product/activity). Policies and programmes to implement these measures should be put in place without delay.

- Energy efficiency and conservation programmes currently in place should be revised to ensure they target minimum life cycle costs to consumers. This will require higher level interventions than public education or price-based measures. Vigorous campaigns to introduce minimum standards for a wide range of energy end-users, in both transport and stationary energy, are justified and should be introduced immediately. The exception is large, technically competent industry players, which are capable of responding appropriately to pricing signals.

- As well as immediate minimum standards programmes, there is a need to implement urban design improvements (including but not limited to greater access to public transport) to minimise New Zealanders' future energy demands.

- Picking technologies is far inferior to driving up minimum standards continuously as technologies improve. For example, solar water heating is only economically viable in particular circumstances and other technologies that are more beneficial in other circumstances may not be implemented unless a standards approach is used.

- A minimum standards approach could be applied to the incoming (imported) vehicle fleet, and could be accommodated without any major disruption to our economy or the creation of adverse social effects. We note that clean diesel is currently the most efficient technology, and we would expect a major shift to this over about 10 years if minimum standards were introduced.

- Efficiency in the existing building stock must be tackled if a real difference is to be made. This will require either a compulsory building rating system designed to create a capital value for energy efficiency, or building upgrades to a minimum standard at the time of sale.

- Energy efficiency programmes are likely to reduce direct fossil fuel consumption but will probably increase electricity use. This will mean that we need to continue to increase our generation capacity.

- A transition towards electricity is likely to be as apparent in transport as it will be in stationary energy. Once electrical storage technologies are available to enable 100-150kWh to be stored compactly and recharged quickly, private passenger transport worldwide could well move to electrically-driven vehicles as they offer solutions to wider problems than just economic fuel supply. Thus the international need for liquid fuel for many types of transport (except for shipping and air transport) might reduce significantly in the longer term.

- Once electrical storage technologies for vehicles are available, use of those technologies in houses would provide at least a partial solution to the problem of matching unreliable electricity supply with demand. It also brings the potential of direct photo-voltaic generation much more into the mix.

- To meet growing electricity demand it is vital that policy and regulatory environments encourage rational long-term decision making in the private sector, ensuring we realise as much as possible of the potential for increased hydro and geothermal generation.

- Supplying a significant part of an increasingly electrically driven economy with unpredictable renewables such as wind and waves, or cyclical renewables such as tides, will only be possible with the development of economically viable electricity storage technologies. There is potential to increase hydro storage, but other forms of storage may also be needed – without storage technologies the only currently available back up is thermal generation. Having sufficient storage capacity may prove pivotal to achieving the Government's goal of carbon neutrality.

- A robust electricity transmission system will remain vital to enable generation and demand to be efficiently coupled. The nature of the transmission system may change dramatically over time if distributed generation and storage become economically viable.

- Rescinding moratoria on certain rivers for hydro development and the possible use of nuclear energy may need to be widely debated in our communities to see whether the values of New Zealanders have changed or will change – they may prefer one of these options to more thermal power plant. However, a watching brief on the technical and economic viability of carbon sequestration or other CO_2 mitigation technologies is also important – using our large coal reserves might then be more publicly acceptable.

- Liquid transport fuel must be considered internationally. Subsidising local transport fuel supply or requiring uneconomic investments in transport fuel production to be made through mandatory obligations is very questionable because it risks capital stranding. A biofuels sales obligation set too high may inadvertently increase life cycle costs for consumers, consume substantial energy in production and implementation costs, and be overtaken by more beneficial technologies in the longer term.

- Public R&D spending on energy should be directed towards:
    - operational research to inform ongoing minimum standard development and updating

- the adaptation of energy efficiency technologies to any special New Zealand circumstances
- support for New Zealand researchers undertaking energy research of international class
- technology development that assists New Zealand to maximise energy recovery from naturally occurring fluid flows (geothermal, hydro, wind, waves, tides)

Response to discussion paper

The following are our specific responses to the discussion points contained at the end of each chapter of the draft strategy. These comments are consistent with the previous essence statement, and also draw on IPENZ's June 2006 publication *Engineering a National Energy Strategy* (available at www.ipenz.org.nz/ipenz/media_comm/Additional_publications.cfm).

2. Resilient, low carbon transport.

- Energy security

Security of transport fuel supply for New Zealand is best addressed by two means. Firstly, we need to maintain sufficient onshore oil supplies. Secondly, there is the possibility of producing limited amounts of fuel from renewable resources in New Zealand.

Given that transport fuel is an international commodity, any New Zealand-based liquid fuel production should be competitive in the global fuel market without ongoing government subsidy. Such a subsidy would commit public capital to a scheme that may not be as advantageous as those possible based on emerging technologies. However, the Government may consider funding research into cost-effective liquid fuels or supporting a marginally economic operation through a market trough for security purposes.

IPENZ considers that major long-term gains in security and sustainability are likely to come from transformational technologies. Under this scenario, renewable liquid fuels produced in New Zealand may only be used for a transitional period until breakthroughs in transformational technologies occur.

A current example of a transformational technology is the emergence of cleaner (lower sulphur) diesel in New Zealand, which opens the way to an increasingly diesel-powered private vehicle fleet. Its uptake in New Zealand has been very low, possibly due to a lack of public knowledge. This could be addressed by implementing minimum standards, incrementally increased as technologies improve, which would support an increasingly efficient vehicle fleet. A public education programme that compares the energy efficiency of vehicles available in New Zealand and also addresses negative perceptions about diesel engine behaviour could also change consumer behaviour.

However, as stated above, we believe that in the future other transformational technologies, specifically electrical technologies, are likely to be developed that will have huge impacts on energy security, the economy and the environment.

- Minimum biofuels sales obligation

As in our submission of 20 October 2006 to the Ministry of Transport, IPENZ supports the biofuel sales obligation only if the following conditions are met:

1. only activities which are, or are expected to become, economically viable in the longer term should be introduced
2. the policies introduced will not inadvertently lead to perverse or undesirable practice, for example activities that fail to decrease CO_2 emissions overall – it is our view that a biofuel requirement should be carefully restricted, with provisions included to

circumvent biofuel options that do not provide favourable life cycle balances for greenhouse gases

It is our understanding that some or even all reductions in CO_2 emissions from the *use* of biofuels might well be countered by the emissions used in the *production* of such fuel. Requiring non-economic activity to occur through a biofuels requirement also increases the potential for expensive capital stranding if other energy-efficient vehicle technologies advance rapidly. We would suggest that, rather than introducing a highly specific requirement like the mandatory sales obligation, it would be better if government introduced minimum standards (as outlined above). Government could also support further research aimed at identifying breakthrough technologies and the likely timetable for their emergence, and highlighting commercial opportunities.

- Public transport

Cost: benefit analysis should be undertaken in conjunction with public surveys to determine public demand and the appropriate level of spending. Such operational research should also take into account the likely relative changes of fuels and other costs over several decades, and potential changes in passenger transport technology. However, it may still be justifiable to pursue public transport, which has social and other non-economic benefits such as reduced congestion, beyond what can be justified on solely economic grounds.

- Emerging technologies

The previous discussion on the biofuel sales obligation demonstrates an overall concern that IPENZ has about the draft NES. The strategy needs to be revised so that it is long-sighted and considers the likely emergence of transformational technologies, which could shift the whole paradigm of how we sustainably produce and use energy. Without consideration of transformational technologies, any incremental approach is unlikely to achieve very large steps towards sustainable energy use in New Zealand, nor cost-effectively meet the Government's goals.

As highlighted previously, likely emerging technologies include improvements in electricity storage for both vehicle and household energy use. A breakthrough would be likely to bring hybrid and/or electric cars to the point of best choice for consumers, based on minimum life cycle costs. A breakthrough in electricity storage capacity would make the use of intermittent household renewable energy sources, such as wind and solar, much more attractive and enable interlinking with transport energy. If these were to be connected to an advanced electrical storage device, linked to the national grid via smart metering, they could substantially increase the sustainability of household energy use and reduce demand, especially peak demand, on the national electricity supply system. This would enable the system to meet possible transport demands with little generation capacity increase.

We are pleased to see the draft NES does include an action to monitor and develop emerging transport fuels but question whether the potential for global transformation has been sufficiently considered.

- Fuel economy

We consider that the Government should take efforts to improve the fuel efficiency of the vehicle fleet. We recommend that a range of tools are used to achieve this:

- Regulation – minimum standards which would restrict extremely inefficient vehicles and would ensure only the most efficient and technologically advanced vehicles enter New Zealand.
- Information – we support compulsory information at point of vehicle sale, particularly in respect of diesel and hybrid technologies.

We also recommend targeted campaigns addressing measures to maximise fuel efficiency, for example reminders at petrol stations to ensure tyres are inflated to the appropriate level and strategically placed signs discouraging idling for long periods of time, quick acceleration, heavy braking etc.

- Electric powered vehicles

As a potential transformation technology which could change the whole paradigm of how we produce and use transport energy, the development and performance of hybrid plug-in and full electric vehicles developed overseas and their suitability for New Zealand conditions should be carefully monitored as discussed previously.

It will also be necessary to plan for possible future take-up of such technologies in order to ensure security of supply and to fully capitalise on their potential. This planning should include operational research to evaluate any necessary action in respect of the technology, and specific aspects such as how electric cars would be efficiently charged and the consequent implications for the electricity supply system.

- Freight

An integrated freight strategy needs to be developed, considering road, rail and sea, rather than a strategy for shipping developed in isolation. This strategy should consider whether ports should be moved to relieve urban congestion in road systems where freight and passengers both contribute to peaks.

- Urban design

We consider that urban design is a very important tool in reducing the need for unnecessary travel, and as such, we recommend that government give this a high priority. We recommend a whole-of-government, research-based approach to examining policies promoting urban design. It is also important that councils consider the implications surrounding planning rules and provide clarity to New Zealanders to enable them to make informed decisions. A National Policy Statement (NPS) on urban design should be considered.

Urban design can also assist in reducing stationary energy consumption, for example by providing guidance on construction orientation to maximise the benefits of passive solar heating and decrease the loss of heat from buildings.

- Changing vehicle technologies and fuels

Whilst in general we consider that costs should be borne where they are incurred (which would favour a per kilometre rather than per litre road user charge) we would not oppose a political decision to keep charges based on fuel volume. It might be argued that vehicle weight is important to road damage and weight is correlated with fuel use.

3. Security of electricity supply

- Security of supply

The Government has essentially established a minimum standard for supply security of one three-month period in 60 years, and the Electricity Commission (EC) is responsible for ensuring this occurs. However, both the electricity market and the EC will need to perform well if this is to be achieved. New Zealand also needs a contingency plan by which short-term demand can be suppressed to avoid security problems in particularly dry years.

In determining a security strategy, the role of electricity storage and storage technologies needs to be considered. Coal stockpiles and hydro lakes store some energy, and there is

potential to increase this by, for instance, pumping water to fill reservoirs using off-peak renewably generated electricity.
Transformational technologies could also affect future security of supply. As indicated earlier, improvement in the technology for storing electricity could prove transformational for both vehicle and household energy use. A breakthrough would be likely to bring hybrid and/or electric cars to the point of best choice for consumers, based on minimum life cycle costs.

This would make electricity security even more critical. For households, a breakthrough in electricity storage capacity would make the use of intermittent renewable household energy sources, and distributed generation, much more attractive. If these were to be connected to an advanced electrical storage device and linked to the national grid via smart metering they could ultimately prove transformational in increasing the sustainability of household energy use and smoothing demand on the national electricity supply system.

This plethora of options, many based on uncertainty over rates of technology development, points to the need for thorough research of all options if New Zealand is to ensure security of electricity supply as technology changes.

- Wind generation

Wind generation is likely to be a useful component of any national energy supply strategy. We note that storage technologies are absolutely necessary to increase the reliance of New Zealand on intermittent renewable resources such as wind.

- Public confidence

The public (business in particular because of its greater capital commitment) need to have confidence in the regulatory authorities and the supply companies. It is imperative that any actions selected provide certainty for those making energy-related decisions to encourage good long-term decision making and investment by New Zealanders.

- Demand-side response

IPENZ believes that smart metering and "time-of-day response" would increase demand-side response as they would allow consumers to make choices about purchasing electricity that could reduce peak demand and reduce the necessary generation capacity.

These techniques could be particularly beneficial if linked to transformational household electricity storage technologies, as this would further encourage electricity to be purchased at off-peak times.

- Gas market and availability

Security of supply is most likely to be assisted by ensuring the market for gas is effective and stable. The Government needs to provide long-term clarity of resource policy and regulations, thereby assisting commercial organisations to manage the considerable risks involved in exploration and development of gas and oil resources.

4. Low emissions power and heat

- Meeting future electricity requirements

There is a growing international evidence base that shows that with a strong government commitment to energy efficiency, based on minimising life cycle cost for the owner, electricity demand can be reduced without economic loss to the nation. Reducing demand is thus the first step to increasing electricity sustainability. When new generation capacity is required, renewable energy options need to be appropriately evaluated. One advantage of delaying the need to add additional generation capacity, by promoting demand reduction, is that the later new technology is brought on line, the more likely it is

that its cost will match that of conventional technologies because of the expected decline in the cost of new technologies. Similarly, technological advances, such as improved household electricity storage methods, may make intermittent or cyclical renewable resources (such as wind or tidal) more valuable.

- Resource Management Act (RMA)

It is imperative that the RMA provides certainty of timetable for investors and developers of energy projects. Such projects are expensive and long term, therefore any avoidable impediments to their progress need to be minimised. IPENZ welcomes proposals in the draft energy strategy, such as a consolidated consenting process, which aim to ensure that consent processes are finished in time for sensible energy planning and construction, and which may give greater certainty over standards for environmental performance.

As stated in *Engineering a National Energy Strategy,* IPENZ believes National Policy Statements (NPSs) should be prepared on generation capacity and electricity transmission. These should express the importance of timely investment to ensure a smooth transition to a sustainable energy supply, and hence the need for an expedited process. The NPSs should give direction for local decision makers, and consequently achieve national consistency under the RMA. When local decisions are made under the RMA, national needs should be considered. The standards should also allow decisions to be anticipated by planners and developers.

- Regulatory issues

It is imperative that any government interventions provide certainty for those making energy-related decisions. The private sector will have difficulty making long-term decisions if they do not have clarity or confidence in the regulators.

- Distributed and small-scale generation

IPENZ believes that distributed energy resources should continue to be encouraged by removing unjustified barriers to such investments. We are aware of anecdotal evidence that claims of technical incompatibility have delayed, or even prevented, small-scale suppliers connecting to the local or national grid.

We believe it is important that appropriate specifications and standards are put in place in the regulations to ensure that small generators have clarity over what is expected of them, and that the technical requirements are reasonable, that is, the requirements are not set unreasonably high (possibly with the intention to exclude them). Storage technologies will also be important for improving the economics of micro-scale generation.

- Energy prices

IPENZ believes that, as a general rule, energy prices should reflect actual costs and include environmental externalities. Only on this basis will users be moved to the options with the lowest minimum life cycle costs. However, there are situations where this may not apply, such as incentives in a contingency plan to ensure security of electricity supply in dry years.

IPENZ also supports, subject to the usual cost: benefit analysis, the use of smart metering and “time-of-day” pricing. If such an approach were to inadvertently penalise lower socio-economic groups they should be compensated through the social welfare system, not energy prices.

As a further comment on chapter 4, *Low Emissions Power and Heat*, we wish to reiterate the recommendation we made in *Engineering a National Energy Strategy* that cost: benefit analyses are undertaken to ensure that all interventions are worthwhile, that is, will lead to the lowest possible life cycle costs. We note that solar water heating is only advantageous in particular circumstances; other technologies may be more beneficial for those in differing circumstances. It may be that other actions are at least as valuable or are needed to make the solar water heating proposal viable; we suggest that this programme, and any others that focus on specific technologies, should be reviewed. IPENZ firmly holds the view that setting performance standards (which can be incrementally increased) is preferable to mandating specific technologies.

5. Using energy more efficiently

- Priorities

IPENZ strongly supports measures to increase energy efficiency, and we consider it imperative that all measures introduced to reduce energy consumption are assessed on how well they target minimum life cycle costs for the consumer.

Given this, we feel that the NES needs to work with the NEECS to ensure that all options are identified and appropriate comparisons made. A mechanism for this, including a methodology for making such comparisons, could be included in the draft NES.

In response to the specific question in the draft NES strategy on greenhouse gas emissions, IPENZ believes that different forms of energy can be compared in terms of their potential to reduce greenhouse gas emissions at minimum cost to the nation. As part of this, energy pricing could include the cost of emissions. This would increase the relative cost of, for instance, coal compared to renewables. We believe that true cost pricing is preferable to the use of subsidies.

- Capital stock

An increased commitment to efficiency in capital stock (buildings and appliances) should include, as a matter of urgency:

1. minimum standards introduced in the Building Code
2. minimum standards for existing building upgrades at time of sale (similar to earthquake strengthening requirements)
3. the introduction of a star rating for homes and buildings which would make efficiency improvements more economically viable by creating a capital value
4. education of consumers to improve their decisions on homes and appliances, including requiring compulsory publication of energy information at the time of purchase of vehicles and buildings

Good design on a life cycle basis is rare – both because good design standards are voluntary and because the owner of a commercial or investment building at the time of construction is rarely the owner as little as one year later. In support of the public good, more stringent minimum standards should be introduced into the Building Code. Any standard should be established on the basis of targeting minimum life cycle cost for the owner, as well as having a demonstrated net economic benefit to New Zealand.

It is worth investigating the benefit: cost ratio of introducing a requirement that, prior to sale, existing buildings are progressively upgraded towards present Building Code requirements for energy efficiency in new buildings. Such a requirement would effectively create a “warrant of fitness” for buildings, indicating that they are fit for purpose. In conjunction with a star rating system, energy efficiency would gain a distinct capital value which is helpful in itself.

- Institutional issues

We question whether suppliers should have an obligation to carry out energy efficiency initiatives with their customers. It is not their core business, and it is not necessarily in their interests to perform this function. Forcing companies to undertake an obligation through regulation would probably not be effective – the companies would be unlikely to do a good job under these circumstances.

6. Sustainable technologies and innovation

- Public and private sector leadership

To increase acceptance by the public of the measures to be actioned, it is vital that the Government explains the importance of moving towards a sustainable energy system and how this can be implemented.

By supporting research into new technologies, the Government can encourage the private sector to respond by undertaking feasibility studies. If these are positive, private sector investment will follow provided the market rules then encourage long-term investment. Whether or not the Government might wish to invest in relevant research to develop concepts to the stage at which they can attract private sector investment should be judged in the context of innovation policy.

Clear specifications need to be developed for the operational research outputs required to inform energy-related decisions. Operational research should be funded through the MED and the Energy Efficiency and Conservation Authority, and not by the Foundation for Research, Science and Technology. Specifications of outputs should be developed by the funding organisations in co-operation with other government departments and the private sector.

- Increasing capabilities and improving co-ordination

IPENZ believes that relevant energy research needs to be supported or incentivised by the Government to ensure that economically viable improvements to New Zealand's energy system result without undue delay. It is pointless to undertake large volumes of research in New Zealand in areas where overseas research activities are very extensive (such as electric cars), but consideration should be given to incentivising:

- research to improve understanding of the impacts of new technologies on both demand management and electricity supply – as technologies improve the potential to harvest and store energy from New Zealand's renewable resources may well change
- research on how to adapt overseas solutions to New Zealand conditions, thereby maximising the potential for demand management or reducing the C intensity of our fuel mix
- research carried out by a local internationally-renowned expert that can give New Zealand a technical edge

As well, there needs to be a government commitment to supporting or facilitating the necessary operational research to quantify the total impact, benefit: risk and cost: benefit ratios for particular actions. There should be public confidence that the research is robust (through public scrutiny and expert peer review), that proposed interventions demonstrably have net economic benefit to New Zealand, and that they benefit consumers.

We note that in 5.3.2 of the draft NES that there is concern over significant gaps in the information required to make optimum decisions on investment in energy efficiency. We strongly suspect that information gaps will also hinder other areas of energy decision making. We think the NES needs to consider how these information gaps can be bridged;

as outlined previously we consider that the necessary operational research should be supported by government.

- Strengthening international linkages

We agree with the strategy's view that international energy research will be very important to New Zealand, and that establishing research excellence in some key areas will be important for reciprocating international research efforts.

Given the importance and potential public good that could arise from early identification of overseas technologies suitable for New Zealand, we believe that public support to join relevant international groups is justified as long as this involves an appropriate mix of public and private researchers from New Zealand. Any intervention should presumably be consistent with the international linkages programme of the Ministry of Research, Science and Technology and the energy research roadmap. The research networks listed in the draft strategy are mostly governmental in nature. We believe it needs to be determined whether these are adequate to ensure effective identification of technologies developed overseas in the private sector. If they are not adequate, it may be necessary to support the development of other linkages.

- Expanding support for innovative activities

IPENZ strongly supports incentives designed to encourage research and development activities and has previously advocated both targeted tax credits and improved co-funding arrangements between Crown Research Institutes and the private sector. Such arrangements can also facilitate the transfer of research-capable personnel to industry.

7. Affordability and wellbeing

- Access to services

We believe this should be addressed in social policy rather than energy policy.

- Underlying causes

We believe this too should be addressed in social policy rather than energy policy. However, as mentioned previously, the introduction of a requirement that buildings are progressively upgraded towards present Building Code requirements prior to sale, may at least assist new home buyers to be energy efficient and, in a country where capital gains are the norm, this is not an unreasonable penalty on the seller.

- Mobility

IPENZ believes that an affordable and convenient public transport system would benefit all New Zealanders. A NPS on public transport should be considered, as might cost injections to ensure that transport systems are attractive to users from both quality and price perspectives. It is important to continue incentivising the use of public transport to increase patronage by maintaining positive attitudes and support for these modes within communities, provided life cycle assessments demonstrate its appropriateness. This is one area where non-economic investment might be justified for wider social reasons. *(see comments on page 5 on public transport).*

- Provision of information

IPENZ strongly supports the Government's intention to ensure all consumers have access to high-quality comparable information on energy services and transport. This should include:

- making consumers aware of *full life cycle* costs
- helping consumers identify the lowest life cycle cost option for their circumstances
- addressing incorrect perceptions, such as negative perceptions of clean diesel engine behaviour, and highlighting energy benefits of such technologies

- making the public aware of other efficient technologies as they become commercially available

We recommend that all public education is easy for consumers to understand and that relevant information is provided at point of sale.

Conclusion

IPENZ believes that New Zealand needs an energy strategy, and agrees that this draft goes a long way towards meeting the needs of such a strategy.

However, we think that the draft needs to be bolder in proposing the use of regulatory and other measures, and that it needs to give greater recognition to the influence that transformational technologies are likely to have.

We also think that further consideration needs to be given to aspects of how the strategy will be implemented, including assurances that a research-informed approach to decisions on energy will be used and that the strategy will link effectively with related government activities.