Environment

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1. Problems Identified

1.1 Clean energy and green technology

There is both an immediate need as well as significant opportunity for New Zealand to shift focus from finite fossil fuels to renewable energy sources and green technologies. Currently there is a lack of vision, leadership, and long-term commitment to benefit from the global shift to green energy and technologies. Potential export revenues and jobs lie untapped.

Co-ordinated efforts are required for a "whole-economy" transformation. There is now an urgent need to plan a gradual and economically sustainable strategy for weaning the country off fossil fuels. There is a wide range of new energy generating technologies that need to be assessed and costed to determine their applicability to New Zealand.

1.2 Minerals exploitation

Uncertainty surrounds some of the techniques and processes being used to accelerate the extraction of hydrocarbons and other minerals from New Zealand's on- and off-shore environments. These include deep-sea oil exploration, hydraulic fracturing (fracking), land-farming of hydrocarbon waste, undersea mining, deep-well injection of wastes, and onshore mining of minerals.

The democratic right to protest against offshore oil exploration has been curtailed by the Government. It has also made offshore drilling resource consent applications non-notifiable (not requiring public announcements and giving people the right to object or put forward their views).

1.3 Smart technology

The development of smart cities has insufficient focus and priority. They continue to be seen as "nice to have" side projects rather than being at the heart of a city's future. The recreation of Christchurch presents an opportunity to build a globally leading smart city.

Smart homes are slow to emerge with issues related to standards, regulations, interoperability and privacy. Little leadership or guidance exists to build smart home networks, in particular greenfield developments. New Zealand faces mid- to long-term transport problems because of an over-emphasis on roads, the decline of rail, and a lack of government interest in modern urban public transport systems.

1.4 Green data centres

Energy consumption by the Internet industry is increasingly coming under scrutiny. With New Zealand's moderate climate and renewable energy sources, there is an opportunity to build world-class green data centres and attract major global Internet companies. Proaction is required to attract the first such company and then support the development of an Internet business ecosystem around green data centres.

1.5 E-waste

New Zealand has successfully made sporadic and one-off efforts to promote recycling and responsible disposal of electrical and electronic waste, such as TV Takeback and e-Day. However, the country has fallen behind others in developing a long-term, sustainable solution.

The Ministry for the Environment is consulting on whether it should intervene to make it compulsory for parties involved to create a product stewardship scheme. Community groups are generally viewing this as positive but want earlier action.

1.6 Natural environment

Biodiversity is under threat in New Zealand, especially in the country's conservation estate. The role of the Department of Conservation has been compromised by cutbacks and a market-led philosophy.

The quality of fresh and marine water environments in some parts of New Zealand continues to deteriorate. Greater priority needs to be given to applying remedies to water and other kinds of pollution to protect the country's 100% Pure brand. Target dates for resolution set by various government, local government and commercial organisations continue to be pushed out and now sit at 2030.

Not enough is known about the extent and potential of our marine fishery. Despite official and some environmentalist sanction, the widespread use of 1080 poison to combat possums is widely criticised.

Maui's Dolphins are critically endangered, which means there is a high risk of it becoming extinct in the near future. As few as 55 individuals over one year of age remain. While they need to be protected from harmful fishing practices and risky marine mining activities to ensure their survival, over 3000 square kilometres of the marine reserve that the Maui's dolphin calls home is to be opened up for oil exploration.

1.7 Carbon pricing

Atmospheric carbon dioxide and other greenhouse gases like methane are at the highest levels they have been for 650,000 years. The planet is warming because these gases trap the sun's heat, resulting in climate change. New Zealand has so far responded mainly through the use of an economic instrument - the Emissions Trading Scheme - which has been watered down to the point of making no difference.

2. Relevant data/research

2.1 Clean energy and green technology

More than a third of the total energy consumed in New Zealand – including electricity, heat and transport fuels – already comes from renewable sources. More than 70% of all electricity is generated by renewable energy, mainly hydro-electricity and geothermal power.

Modelling commissioned by Greenpeace NZ to identify the benefits of moving to 100% renewable energy shows the target could be reached by 2050, and jobs created would be double that of fossil fuel reliant "business as usual". Billions in oil imports could be saved by expanding public transport systems.

Global trends suggest most potential lies in solar, wind, biomass and ocean generation systems, as well as greater use of geothermal energy, where New Zealand has advanced expertise from decades of experience at Wairakei and other fields.

According to Consumer NZ, current renewable energy sources include hydro (generating around 60 percent of New Zealand's electricity), geothermal in the Taupo volcanic area (around 10 percent), wind (about 3 percent), solar (only around 0.1 percent), and marine energy, which converts waves and tidal motion into electricity through turbines in the ocean (still at a design and testing stage).

Although solar energy is the world's most abundant source of power, development in New Zealand has been slow, largely because hooking up to existing supplies generated by hydro dams and fossil fuel-powered stations is convenient and low in capital outlay. Although some components are getting cheaper, solar systems continue to be expensive, while buyback schemes – where power companies buy excess solar power generated during the day and sell it back to consumers at night – are not particularly attractive. Around 1.6% of homeowners in New Zealand have now installed solar water heating systems, and currently there are around 3,400 new solar water heating systems installed each year. This number is growing at around 30-40% annually.

Other means of generating power being researched and experimented with include hydro-thermal, algal biofuel, radical decentralisation, nickel-hydrogen reaction/cold fusion. There are also advances in energy conservation and the development of vehicles powered by fuel systems other than petroleum and diesel.

Complementing trends in renewable energy development is a parallel interest in green technologies that are being applied to construction, appliances, manufacturing, transport, water and soil use, and ways to cut waste and recycle, creating more and better-paid jobs. According to California-based organisation Green Technology, the sector "encompasses a continuously evolving group of methods and materials, from techniques for generating energy to non-toxic cleaning products".

Examples of green technology include those affecting energy (the development of alternative fuels, new means of generating energy and energy efficiency), green building (everything from the choice of building materials to where a building is located), environmentally preferred purchasing (the search for products whose contents and methods of production have the smallest possible impact on the environment, and these become preferred products for government purchasing), green chemistry (products and processes that reduce or eliminate the use and generation of hazardous substances), and green nanotechnology (the application of green chemistry and green engineering principles to this developing field).

New Zealand's Green Growth Advisory Group concluded in 2011 the country needs a "whole-economy approach" to greener growth, which would come from "many and various shifts within and between sectors towards greener products, services, technologies, practices and markets. Innovation involving knowledge and technology is critical to greening the growth of every sector…"

2.2 Minerals exploitation

Some of the most intense public debates concern various oil exploration and processing practices- including hydraulic fracturing (fracking), deep-sea drilling, land-farming and deep-well injection– and seabed mining for iron ore and other metals. Deep-sea drilling off the coast holds inherent risks, and New Zealand has limited resources to combat a major blowout and oil spill. International markets are sensitive about the risk of burying oil drilling wastes on farmland. Oil industry wastes continue to be pumped under pressure into underground formations without anyone knowing for sure how safe the practice is and how much the geology can take.

2.2.1 Fracking

In March, 2012, Parliamentary Commissioner for the Environment Jan Wright announced that as a result of many requests to her office she would conduct an inquiry into hydraulic fracturing (fracking). A year later, her report of 77 pages canvassed the issue here and overseas and concluded there was no evidence fracking had so far contaminated New Zealand's underground freshwater reservoirs. She said the environmental risks associated with fracking could be managed effectively provided, to quote the Royal Society of London, "operational best practices are implemented and enforced through regulation".

She found among other things that the Taranaki tight gas sands had been fracked 78 times since 1989, at an average depth of just under 3000 metres (deepest 4400m, shallowest 1100m). While the great majority of wells were fracked thousands of metres below freshwater aquifers, two put down in South Taranaki by Swift Energy in 2005 were within a couple of rugby field lengths of the aquifer, albeit separated by impermeable rock.

Although public debate in New Zealand diminished in 2013 in the wake of the Wright report, the topic continues to be heavily reported in the US and the UK. Several countries, France for example, have introduced bans or moratoria until the safety of the practice is established. Wright produced a second report in June 2014, by which time the Ministry for the Environment had to some extent preempted that by adopted a set of recommendations to guide oil and gas companies.

In her latest publication, entitled *Drilling for Oil and Gas in NZ: Environmental oversight and regulation*, the commissioner said while the Ministry's report clearly described the status quo for oil and gas regulation, it did not provide sufficient guidance for the government and regional councils for the future.

While fracking had been mainly confined to Taranaki, where that had been no apparent problems, there were plans for it to be used extensively on the East Coast, where the geology was more like that of the US shale gas regions, where problems had arisen.

She said regional councils outside Taranaki were ill-prepared to deal with oil exploration growth and a national plan was needed, as well as clearer and more consistent guidelines for regional councils. Her report includes a number of recommendations to that purpose.

2.2.2 Land-farming

This refers to an oil industry technique that uses land to treat some of the hydrocarbon wastes derived from the industry's exploration activities, the outcome being the conversion of marginal grazing land into productive pasture. It has been **controversial** in Taranaki after some of the 30-odd farms were found to be breaching resource consent conditions, and the province was going to be a dumping place for wastes from oil exploration elsewhere in the country.

In 2013, in an effort to calm international market **concerns**, Fonterra **announced** it would take no more milk from new land-farming operations. The regulatory body, Taranaki Regional Council, is now favouring deep-well injection over land-farming.

The commissioner said in her June report that a related process called mix-bury-cover used in Taranaki was not safe and there was urgent need for regulations to be put in place. The Taranaki Regional Council **announced on July 3** it had set up an investigative group to look for solutions.

2.2.3 Undersea mining

A six-year **study** by GNS science reported in 2012 that there could be tens of billions of dollars-worth of minerals to be found offshore. An example of how this will be exploited is Wellington-based Trans-Tasman Resources, which wanted to mine about 66 square kilometres of seabed in relatively shallow water in New Zealand's Exclusive Economic Zone, between 22km and 36km offshore from the South Taranaki coastal town of Patea.

The company was **granted** a mining permit by the New Zealand Petroleum & Minerals arm of the Ministry of Business, Innovation and Employment, but was **denied consent** by the Environmental Protection Authority which said, "the major reason was uncertainty around the scope and significance of the potential adverse environmental effects, and those on existing interests, such as the fishing interests and iwi."

2.2.4 Deep-well injection

This technique was developed prior to 1930 by US oil companies as a way of getting rid of fluid wastes from oil drilling operations. They pumped the wastes down into dry wells under pressure and filled porous rock formations underground. Later the wells were sealed with concrete. However, some **leaked** into nearby abandoned wells and wastes returned to the surface, sometimes on farmland.

Oil companies in Taranaki have been using deep-well injections since about 1975, and have so far pumped about 35 million cubic metres of wastes down about 1500 metres into a dozen or so wells. None has leaked and no freshwater aquifers have been affected, but the regulatory body, Taranaki Regional Council is **unable to say** what the geology's long-term capacity might be. Overseas research has recently **raised concerns** about the impact of earthquakes.

2.2.5 Deep-sea oil drilling

In May, 2013, the Government established new protocols for deep-sea oil exploration in much deeper offshore marine environments than before. They are part of the Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act (the EEZ Act), whose purpose is to promote the sustainable management of the natural resources of the EEZ and continental shelf. The Exclusive Economic Zone is the area of sea, seabed and subsoil from 12 to 200 nautical miles offshore.

This caused alarm among environmental groups, especially after a June 2013 **media report** that if a well blowout occurred during deepwater drilling operations, four jumbo jets full of equipment would need to be deployed to deal with the emergency. It would take up to two weeks to get the equipment from the UK to the well site. Other estimates put the delay at more than a month.

Greenpeace published a **report** estimating the extent to which New Zealand's coastline was likely to be affected by an uncontrolled blowout. In late 2013, drilling company Anadarko, which made the first attempts at deep-sea drilling in 2013, released a 1700-page report confirming there was a risk of coastal pollution in the unlikely event of a major accident. Greenpeace **challenged** the report and when the first drillship arrived off the Waikato coast, attempted to stop drilling with a protest fleet and a court challenge, which failed.

The Government moved to curtail protests against offshore oil drilling by amending the Crown Minerals Act whose Section 101B is entitled "Interfering with structure or operation in offshore area". It has also made offshore drilling resource consent applications **non-notifiable** (not requiring public announcements and giving people the right to object). The same lack of public warning also applies to land-based resource consent applications made by oil companies to Taranaki Regional Council, meaning people have no opportunity to submit or object.

2.3 Smart technology

2.3.1 Smart cities

The concept of the smart city has emerged over two decades. It is built around the **idea** that future success of urban communities will depend not only on a city's infrastructure (physical capital), but also "the availability and quality of knowledge communication and social infrastructure - human and social capital".

A **smart city** "brings to the forefront the idea of a wired city as the main development model and of connectivity as the source of growth". Networked infrastructure - business services, housing, leisure and lifestyle services, and information technology (mobile and fixed phones, satellite TVs, computer networks, e-commerce, Internet services)- **improves** economic and political efficiency and enables social, cultural and urban development.

Information technology **drives** greater automation within city utilities and creates more energy efficient and productive places in which to live and work.

Initiatives may include or address issues like congestion such as Stockholm's and Singapore's invisible tollbooths, pre-pay travel cards, and variable charges to make traffic flow more efficient. In Singapore's case, signals also indicate available parking spaces within the city. Others include transport smart cards, where integrated ticketing systems are the norm, or an array of sensors that enable local authorities to monitor everything from noise levels, cracks in buildings and streets, dust problems to the level of rubbish in bins.

The Christchurch rebuild is the most quoted example of how New Zealand can harness the advantages of smart city thinking. **Ideas mooted** included tri-generation technology (which combines electricity generation, heating and cooling), a thermal network (hot water reticulation), water recycling for

air-conditioning towers, micro wind generation, solar panels for power generation and efficient LED street lights: “We can become a connected society with ubiquitous, high-speed, reliable wireless data connections throughout the central business district.”

Computer giant IBM has entered a partnership with the government and city council to ensure some of the $40 billion being spent to recreate the city after earthquake devastation will focus on the smart city concept.

The company has given Christchurch one of its Smarter Cities Challenge grants and last year six IBM executives worked up **recommendations** such as developing “collaboration hubs” to bring together local and global universities, schools, businesses and agencies, and investment; using social technology to engage the creativity and energy of local people; and creating a digital infrastructure that makes the city a desirable location for technology businesses in Australasia.

Auckland drivers could benefit from greater funding to improve the city’s aged and under-managed traffic light management system.

2.3.2 Smart homes

These use fast broadband, wifi, computer systems, sensors and meters to monitor, direct and make more efficient a range of household functions such as energy generation, lighting, heating, ventilation, air conditioning, home entertainment, remote access for tradespeople, support for the disabled and elderly, security, lighting, watering indoor plants, and feeding pets.

Now, the "connected home" is becoming a reality thanks to improved broadband networks and mobile apps, **writes** US technology commentator Frank Gillett.

“The connected home is no longer a futuristic vision - many of the barriers that blocked the realization of a smart home have eroded. Network bandwidth is widespread, connectivity is becoming more common in many traditional home products, and consumers are craving smart-home experiences. Technology, which had presented the greatest challenge to creating a connected home, is now manageable.”

A US research company predicts that by 2018 one-third of households worldwide will have the home networks that power smart homes, an increase of 8.4 percent over the current 24.8 percent. However, the company’s report **notes** (low) average revenue per user and limited infrastructure are retarding growth in countries with developing economies.

One way New Zealanders can prepare for the smart home era and gain a measure of control over their energy use is to replace their existing traditional electricity meter with a free electronic smart meter. New Zealand is expected to have about 1.6 million by 2015.

The meters record more regular and accurate electricity consumption information and have two-way remote communication capability. Immediate benefits include bills based on actual consumption (not estimates), removing the need for the regular visits by a meter reader, remote connection and reconnection, easier change to another retailer, and more information about a household’s power use.

Other **benefits** will flow to over time as new tariffs, products, appliances and opportunities can be made available with smart meter technology. Some **controversy** surrounds use of the meters.

2.3.3 Smart transport

Issues facing New Zealand’s transport systems are acknowledged by the government department responsible for finding solutions, the NZ Land Transport Agency. In a **website outline** last updated in August, 2012, the agency notes the demand for transport is expected to increase in terms of absolute quantity and “modal choice”, although the location of demand will vary.

The agency's response is, among other things, to invest in transport planning to help cater for population growth and changes; invest in the existing transport network to improve capacity in growing areas; provide new and improved transport infrastructure in growth areas, particularly Auckland; and provide more "modal choice, particularly in the main centres to cater for changes in population density and demographically driven travel behaviour changes".

Greenpeace is critical of this approach. "The consequence of the Government's plans will have a negative impact on the economy, resulting in increased household fuel costs, and a burgeoning emissions burden," Greenpeace Climate Campaigner Steve Abel **said** when the policy was announced in 2011.

All that would grow as a result of the plan was road congestion, vehicle emissions, and household petrol costs, he said. Meanwhile rail - with its huge potential to free up roads and meet transport needs, while reducing New Zealand's oil dependency – was being starved at the margins. "Distributing the billions allocated to new roads instead to projects like the CBD rail loop for Auckland, and by providing seed money for our best cleantech entrepreneurs, would yield far better returns." He said New Zealand's future did not lie in increasing reliance on fossil fuels. The numbers of people using rail in Auckland had recently jumped by 20 percent, to over eight million trips. People were voting with their feet for public transport.

Auckland's particular traffic woes have a long **history** of debate. As the city grows and spreads, daily traffic jams get worse and commuters spend hours getting to and from work on clogged urban motorways and contributing road networks. Little hope of resolution is held out by commentators, who **say** the continued expenditure on roading at the expense of public transport and light rail is deluded.

Auckland drivers could benefit from greater funding to improve the city's aged and under-managed traffic light management system. Based on one developed in Sydney nearly half a century ago - Sydney Co-ordinated Adaptive Management System (Scats) - the system needs **urgent attention**, according to a recent editorial in the NZ Herald.

In 2010, the Government announced it would allow bigger trucks to use New Zealand roads, a development that drew criticism from lobby groups such as The Campaign for better Transport. Its website **said** the proposal to introduce bigger and heavier trucks onto New Zealand roads was flawed because insufficient information had been provided to explain the economic justification; larger trucks would lead to significantly more wear and tear on roads, probably meaning increased road-user charges; trucking would compete more directly with government-owned rail for bulk goods transport; there would be safety issues for other drivers; and environmental effects would include greater CO_2 emissions, more particulate matter pollution and more noise pollution.

2.4 Green data centres

Massive data centres operated by companies like Google, Facebook, Apple and Amazon consume large amounts of electricity for functions like cooling. Greenpeace **says** a single one can require as much energy as a medium-sized city. If cloud computing were a country, it would rank **sixth** in the world because of how much electricity it uses. Most of it is generated with **fossil fuels**.

The amount of data shuttling around the world is expected to triple in the next few years. In the face of criticism, cloud owners are looking to re-establish operations that not only use less power, but power than comes from renewable energy. Apple, for example, announced in 2012 it would be powering at least part of its new $1 billion data centre in North Carolina with a solar array located on about 70 hectares of nearby land. Apple also **claimed** to be building a five-megawatt, biogas-powered fuel cell near the data centre.

Over the next 15 years, the majority of data centre **growth** will occur outside the US, **says** Scott Noteboom, a former data centre executive at Apple and Yahoo! At the opening of IBM's modern data centre in Auckland in 2011, NZICT CEO Brett O'Riley **said** ready access to renewable energy from a variety of natural resources presented significant opportunities to the New Zealand data centre and data storage market.

2.5 E-waste

Electronic waste or e-waste is discarded electrical and electronic devices such as computers, televisions, and refrigerators. All electronic scrap components, may contain contaminants such as lead, cadmium, beryllium, or brominated flame retardants. Recycling and disposal of e-waste may involve significant risk to workers and communities. Great care must be taken to avoid unsafe exposure in recycling operations and leaking of materials such as heavy metals from landfills and incinerator ashes.

It is estimated that about 80,000 tonnes of e-waste go into New Zealand landfills every year, making up 2% of waste, but 70% of toxic waste. The first e-Day, aimed at being both educational and disposing of e-waste responsibly, was launched in Wellington in 2006. eDay 2010 resulted in over 900 tonnes of e-waste being collected at 53 drop off locations across the country. These events are no longer held as support shifts to more permanent solutions.

Besides the environmental impact, improper disposal of electronic devices can have information security risks such as confidential or private information being exposed.

Reusing and refurbishing needs to be integrated with safe waste disposal. The environmental and social benefits of reuse include diminished demand for new products and virgin raw materials (with their own environmental issues); larger quantities of pure water and electricity for associated manufacturing; less packaging per unit; availability of technology to wider swaths of society due to greater affordability of products; and diminished use of landfills.

A recent successful e-waste programme in New Zealand was TV Takeback, diverting televisions discarded as a result of the digital switchover from going to landfills. The scheme involved the Government working with a range of councils, recyclers and retailers to provide a nationwide network of subsidised options. A total of 228,355 were collected under the programme.

Increased attention is now being paid to sustained solutions such as product stewardship, including for electronic and electrical equipment. Under product stewardship schemes, producers, brand owners, importers, retailers, consumers and other parties accept responsibility for the environmental effects of their products – from the time they are produced until the end of their useful life and disposed.

Product stewardship means that the cost of recycling is built into the price of new products so New Zealanders can recycle responsibly at no extra cost when the equipment reaches end of life.

One such voluntary scheme exists for mobile phones, called RE:mobile and has recently been accredited under the Waste Minimisation Act. To date, around 900,000 phones have been collected under the scheme. it is estimated that each year up to three million mobile phones become obsolete in New Zealand. Of those, only about 2 percent are recycled.

The Ministry for the Environment is consulting on "whether it should intervene to improve the management of four product waste streams" including electronic and electrical equipment. This could make it compulsory for parties involved to create a product stewardship scheme "in association with, or independently of, regulations set under the Waste Minimisation Act."

Community groups are generally viewing this as positive but want earlier action. Councils of the Wellington region have previously called for a national product stewardship approach for e-waste. This was unanimously endorsed by LGNZ annual Conference in July 2013.

2.6 Natural environment

2.6.1 Biodiversity

Biodiversity means the variability among living organisms from all sources. It is under threat in New Zealand. According to the Ministry for the Environment, climate change will inevitably impact on biodiversity. "A number of biological changes have already been observed globally including shifts in the range of some species, and earlier timing of leaf-unfolding, bird migration and egg-laying in some species."

"Other effects may include strong impacts as extreme weather events become more frequent and severe; changes to ecosystem productivity, and disruption of freshwater ecosystems due to warmer water and lower flows in rivers and streams. The most serious threats to biodiversity in New Zealand may arise from the establishment and expansion of invasive pests and weeds under climate change."

New Zealand's farming, forestry and horticulture depend on the resources and services provided by biological systems and protecting the natural resources and the introduced species on which these industries are based, from pests, weeds and diseases is important to New Zealand.

2.6.2 Conservation estate

New Zealand's conservation estate covers nearly a third of the country's land area- 30% or about 8 million hectares of native forests, tussock lands, alpine areas, wetlands, dune lands, estuaries, lakes and islands, national forests, maritime parks, marine reserves, nearly 4000 reserves, river margins, some coastline, and many offshore islands.

All of the land under its control is protected for either conservation, ecological, scenic, scientific, historic or cultural reasons, and for recreation.

Much of it is under the care of the Department of Conservation, which has been compromised by cutbacks and a market-led philosophy. The department's restructuring and staff sinking-lid policy have seriously diminished its front-line capability, according to environmentalists.

2.6.3 Water quality

Abundance of freshwater and a rich marine environment are two of the country's biggest assets, but both are at risk from pollution and reckless use. This is a direct threat to the hugely successful tourism and marketing brand, 100% Pure, which has been questioned by overseas media in the light of scientific evidence from environmental academics.

Commissioner for the Environment Jan Wright issued a report in 2013 that drew attention to the problems dairy farms are causing for rivers and lakes: "Unfortunately, if we continue to see large-scale conversion of land to more intensive uses, it is difficult to see how water quality will not continue to decline in the next few years. This is despite the best efforts of many and some undoubted successes."

Various organisations, including the Ministry for the Environment and other ministries, regional councils, the Land and Water Forum, Fonterra and Federated Farmers have announced new measures to reduce diffuse runoff from farms, which is now the greatest threat to rivers, lakes and streams.

But the Sustainable Dairying: Water Accord launched by Fonterra and others in 2013 to replace the failed Clean Streams Accord gives farmers until 2030 to take action on some issues, and still does not include small streams and creeks. Dairy farmers face expenditure in excess of $700 million over the next few years if they are to meet even that modest deadline.

The Ministry for the Environment has been announcing national water quality standards in stages, but these are necessarily broad because of big variations in geology, catchment structures and climate between regions. Critics like Massey University environmental scientist Mike Joy say the measures have been set deliberately low to ensure most waterways meet them even in their current degraded state, while the Commissioner for the Environment has dismissed the ministry's efforts as "not adequate for protecting water quality to even current levels in New Zealand".

It is up to councils to pursue more detailed measures and progress is uneven. Only Taranaki – which has 10 percent of the dairy industry's cows - has a region-wide riparian exclusion and planting programme that is well advanced.

2.6.4 Marine fisheries

While OECD data shows only about 10% of our marine fish species are threatened (compared with the global average of 28%) and although most fish stocks have not been reduced to the same extent as in fisheries like the North Sea, the South Australian Shelf and the Newfoundland-Labrador Shelf, there is ever-present pressure to increase annual takes. Dr Matthew Dunn, principal scientist at the National Institute of Water and Atmospheric Research (NIWA), says more needs to be known about smaller fish stocks to find the actual extent of the New Zealand fishery.

2.6.5 Maui's Dolphins

According to the Department of Conservation, "Maui's dolphins are a sub-species of Hector's dolphins, the world's smallest dolphin. They are found on the west coast of the North Island of New Zealand and nowhere else in the world. It is one of the world's rarest dolphins."

"The dolphin is listed internationally as 'critically endangered', which means there is a high risk of it becoming extinct in the near future. A recent abundance estimate for Maui's dolphin indicates as few as 55 individuals over one year of age remain."

Much of the Department's work is influenced and guided by the Hector's and Maui's Dolphin Threat Management Plan. A review of the Maui's dolphin portion of the Plan was brought forward after a Hector's/Maui's dolphin was found entangled in a set net off Cape Egmont, Taranaki in early 2012.

The World Wildlife Fund's position is that Maui's need to be protected throughout their range from harmful fishing practices and risky marine mining activities to ensure their survival. This requires a genuine sanctuary from Maunganui Bluff to the Whanganui river mouth, including harbours, out to 100 metres deep. According to a poll it commissioned, 62% of New Zealanders think the Government should spend money to assist fishers to transition to dolphin-friendly practices.

Over 3000 square kilometers of the marine reserve that the Maui's dolphin calls home is to be opened up for oil exploration. The Government says that there has been significant drilling activity in the area already without incident, with "over 95 percent of the risk is from set netting and from fishing."

The risk of Maui's Dolphins going extinct is not just theoretical. For example, in 2006 experts found that the rare Chinese river dolphin "baiji" had gone functionally extinct.

2.6.6 Pest control

While the Government claims success for the aerial spreading of toxic 1080 bait to kill possums, too little focus and funding is placed on finding more-targeted methods that do the job but offer better protection for wild birds and animals. Lobby groups say "the use of 1080 poisoning as the main weapon in the war against animals regarded as 'pests' is an extremely cruel practice".

2.7 Carbon pricing

A carbon price is the amount that must be paid for the emission of 1 tonne of carbon dioxide into the atmosphere. Such payments usually take the form of a carbon tax or the cost of purchasing emission allowances in a cap-and-trade system.

The purpose is to force emitters to pay at least part of the cost of the negative externalities (pollution costs) caused by CO_2 emissions, which come mainly from burning fossil fuels and making cement and steel. If the

full cost of externalities is included, emissions will be reduced to an efficient level. The source of these negative externalities for CO_2 is assumed to be **climate change**, since CO_2 is a known greenhouse gas.

According to Wikipedia, a key **dispute** concerning carbon pricing is whether it is better than subsidising alternative energy sources. "The economic argument favours pricing because of its efficiency. When carbon emissions are taxed, all alternatives are helped equally and without favouritism. This would include, wind, solar, nuclear, home insulation, choosing to drive your higher mileage car, living closer to work and installing LEDs, to name a few."

It is essentially impossible to subsidise all of these equally and in practice the subsidies are extremely unequal. For this reason subsidies are less efficient. Other advantages are claimed for renewable subsidies, but efficiency is considered decisive by most economists, as was attested to in the **Economists' Statement on Climate Change**, signed by over 2500 economist including nine Nobel Laureates in 1997.

Greenpeace NZ **says** in the final months of 2012 the current government further weakened the Emissions Trading Scheme, handing a get-out-of-jail-free card to the nation's biggest polluters, and withdrew from the Kyoto Protocol.

"The New Zealand Emissions Trading Scheme (ETS) is intended to provide a price incentive for people and businesses to reduce carbon emissions. The Government 'reformed' the ETS in a way that prices carbon at the lowest available global price, regardless of the quality of the carbon credit, by repealing restrictions on the type of credit that can be surrendered under New Zealand's Kyoto obligation.

"Our restrictions were similar to the EU's restrictions. Now we have no restrictions. The Government's policy is 'to ensure businesses and households do not face additional costs' from the ETS. This defeats the price signal purpose of having an ETS, so the policy is now merely window dressing.

"Earlier the Government repealed the 'thermal ban' clause of the ETS legislation, which restricted new thermal electricity generation. It halted the introduction of a vehicle fuel economy standard that would have lowered the **carbon** dioxide emissions from our vehicles. It also repealed a very modest biofuel sales obligation."

3. Examples of Global Leadership

3.1 Clean energy and green technology

3.1.1 Wind

Denmark is the world's leading **wind turbine** developer, especially for offshore locations, already generating an average 28 percent of its electricity from windmills, and aiming to lift that to 40 percent.

On November 3, 2013, wind power production in Denmark **exceeded** the level of power consumption, an event not considered especially exceptional. The days when renewable electricity completely offset conventional power on workdays are fast approaching and Denmark has near **100 percent wind power** increasingly often. Denmark has a target of 100 percent renewable energy by 2050.

The Danes plan to store excess electricity partly as heat by running electric heating systems when power is cheap. Eventually, it could also be stored chemically, such as via electrolysis to produce green hydrogen. At that point, the heat and transport sectors could theoretically also be served with excess green power.

3.1.2 Solar

There are numerous examples of leadership in the use of solar energy, not the least Germany after it decided to close its nuclear power stations following the Japan earthquake. However, although solar energy

offers vast potential and costs are dropping rapidly to match those of conventional generation, some exponent countries offer cautionary tales.

In 2013, Germany's solar power industry suffered setbacks that caused job losses and company collapses. These arose partly because of a flood of low-price Chinese components and partly because solar energy's contribution had been exaggerated- it generated 50 percent of the nation's power on one afternoon only, and generally achieves only about 5 percent.

Spain was similarly lauded, but the Global Financial Crisis has forced it to backtrack on policy that paid high dividends to those building solar installations at home.

Sun-drenched Australia has better prospects, but future commitment may stall temporarily. Multinational solar panel maker First Solar- the company building the southern hemisphere's largest solar plant, a $450 million installation in New South Wales big enough to power 50,000 homes - says it is reconsidering investment in Australia because of uncertainty about the government's Renewable Energy Target.

3.1.3 Hydrothermal power

US company Marshall Hydrothermal says it is providing the world with the first and only patented solution to unlock the potential from deep-sea hydrothermal vents. Its website says the Marshall Hydrothermal Recovery System (MHRS) can deliver base-load electrical power, millions of gallons of desalinated water, and extensive mineral/metal/resource mining capability.

A study of submarine hydrothermal vents (hot springs) began in 1977 near the Galapagos Islands. New Zealand's GNS science says hydrothermal vents– whose hot emissions the Marshall system harnesses- are commonly found near volcanically active places, areas where tectonic plates are moving apart, ocean basins, and hotspots. Locally, many hydrothermal vents have been found along the Kermadec Arc associated with active submarine volcanoes.

3.1.4 Green building

Cape Town's V&A Waterfront, a 400,000 square metre mixed-use development that sees 23 million visitors per year, is demonstrating measurable results from its $3.5 million green building retrofit that began in 2008 and took place gradually over three years.

Major energy saving initiatives were added over time and included installation of additional power factor correction equipment, energy efficient lighting and a lighting control system, energy efficient escalators and lifts, and use of seawater cooling instead of traditional cooling towers.

The project also introduced water conserving and waste management initiatives, with annual savings of $70,000 and $110,000, respectively. The development can now demonstrate a 17% drop in energy costs and savings of nearly three-quarters of a billion dollars a year.

3.2 Minerals exploitation

3.2.1 French fracking ban

France's constitutional court last year upheld a 2011 ban on hydraulic fracturing, ruling French law against the energy-exploration technique is a valid means of protecting the environment. The court said the 2011 law "conforms to the constitution" and is not "disproportionate".

A Dallas-based oil explorer complained to the court that the law was unfair and argued that there was no study that established risks from fracking. The court ruled that in imposing the ban, lawmakers were pursuing a legitimate goal in the general interest of protecting the environment and noted differences

between geothermal and shale gas exploration techniques. The court also rejected an argument that the ban went against property rights.

French president Francois Hollande has said France would not allow exploration of shale energy even as the country seeks to reduce its reliance on nuclear energy and keep down costs for consumers.

3.2.2 Alternatives to deep-well injection

Not all the liquid being re-injected into underground formations in New Zealand has to go there – some could be made into stock and drinking water, thus reducing the massive volume of fluids being pumped into geology that may one day be affected by earthquakes and fault shifts.

A major component of fluids disposed of by deep-well injection in New Zealand is saline water produced from gas and oil exploration wells. When reviewing regulation of deep-well injection by Taranaki Regional Council, GNS Science **commented** that there was potential for the brackish salt water to be desalinated, so the council should "change its designation of unusable salt water aquifers to a much higher level of salinity, given the continuing improvements to desalination technology".

This is being explored in The Netherlands, where a **2013 report** said: "In the province of Friesland (in the Northern part of The Netherlands), problems have arisen with the abstraction of fresh groundwater due to salinization of wells by upcoming of brackish water. A solution to this problem is to intercept (abstract) the upcoming brackish water, desalinate it with a brackish water reverse osmosis installation, and dispose [of] the concentrate in a deeper, confined aquifer."

The fresh-brackish interface in the source aquifer is stabilised by simultaneous abstraction of the fresh and brackish parts. After desalination, the abstracted brackish water provides an additional source for drinking water. To demonstrate the feasibility of this concept a pilot study was set up and showed that "brackish groundwater provides an excellent, additional source for drinking water".

3.3 Smart cities

3.3.1 Best internet city - Seoul

Internet speeds: The city's mean Internet throughput is 41.4 Mb/s, according to net measurement company Ookla. Another firm, Akamai, reports that South Korea has the highest average rate of Internet speed in the world at 14.2 Mb/s, and that a full 50 percent of all connections in South Korea are over 10 Mb/s. Compare that against the global average of 3.1 Mb/s.

WiFi: The government is aggressively building out WiFi nationwide, planning for 12,000 public wireless zones by 2017, with half of those to be in place by 2015 in public health centres and other community locations. Add to this the availability of 4G LTE networking at Incheon Airport and elsewhere.

Innovation: Though Korean laws have been criticised for hindering start-ups, at least one investor thinks Seoul is unstoppable. Bernard Moon, founder of SparkLabs, a start-up accelerator, said in a recent interview with The Wall Street Journal: "Seoul is unique because entrepreneurship is growing and also because it has trendsetter technologies. It's such a hotbed of urban entrepreneurship."

3.3.2 Best urban sustainability cities

Bogota, Colombia - Urban Transportation

The city's rapid transit system was launched in 2000 to transport more than 70 percent of its population and, as a result, has reduced annual emissions by 350,000 tonnes. Now the city is working to replace the current diesel fleet with hybrid and full electric buses with an aim to reach 100 percent conversion by 2024.

Bogota also started an electric taxi pilot programme and has pledged to convert 50 percent of its cabs within the next 10 years.

Copenhagen - Carbon Measurement and Planning

Copenhagen's 2025 Climate Plan put it on track to become the first carbon neutral capital city. The plan includes lowering energy consumption in commercial buildings by 20 percent, households by 10 percent and public buildings by 40 percent. Street-lighting will use 50 percent less energy and all of the city's electricity consumption will come from renewable sources by 2025.

Melbourne - Energy Efficient Built Environment

Melbourne has created a sustainable buildings programme that encourages building owners and managers to improve energy and water efficiency and reduce their waste to landfill. The city government has set a target to reduce carbon emissions from the commercial sector by 25 percent and from the residential sector by 20 percent. The city will achieve that through environmental standards on new buildings as well as financial incentives and advice for upgrading and retrofitting existing buildings. The so-called 1200 Buildings programme was designed to encourage the retrofitting of 1200 commercial buildings, about 70 percent of the city's commercial building stock.

Munich - Green Energy

In 2009, the city set a goal of achieving 100 percent renewable energy supply - at least 7.5 billion kilowatt hours per year - by 2025. The city-owned utility company has focused on cost-efficient projects that are self-sustaining. Water, geothermal, solar biomass and wind power all play a role in its strategy.

San Francisco - Zero Waste Programme

The city's zero waste efforts have pushed landfill diversions from 35 percent in 1990 to 80 percent in 2010. Last year, the city disposed of 428,048 tonnes of material, the lowest level on record. Mandatory recycling and composting increased organics collection 50 percent to more than 600 tonnes per day, more than any composting programme in the US.

Singapore - Intelligent City Infrastructure

Singapore has a lack of space and a booming urban population, a combination that has made traffic management a challenge. The city-state has implemented an intelligent transport system along with a number of initiatives, including free public transportation in pre-morning peak hours, a vehicle quota system, congestion charge and extensive public transport system. Singapore also has an electronic road pricing system, which are tolls that vary according to traffic flows.

Tokyo - Finance and Economic Development

Tokyo launched the world's first urban cap-and-trade programme in 2010, requiring carbon emission reductions from large commercial, government and industrial buildings through on-site energy efficiency measures or participation in the emissions trading scheme. Tokyo set the cap at 6 percent for the first compliance period of fiscal years 2010 to 2014. In its first year, the participating 1159 facilities reduced emissions by 13 percent. Reports submitted at the end of November 2012 bring the second-year total to an overall 23 percent emissions reduction below the base-year (2000) emissions.

3.4 Green data centres

3.4.1 Sutton, UK

Plans have been approved to build on a 16 hectare campus in Sutton, Cambridgeshire, creating 65,000 square metres of data halls. The north Cambridge site will target global enterprises, local "silicon fen" technology giants and small-to-medium businesses.

A new on-site primary electricity substation will initially give a 33kv 6MVA supply to support the first phase of development, with a total 25MVA contracted provision agreed with UK Power Networks. The IT infrastructure will have ambient air-cooled modular data centre units and get its power from sustainably generated electricity sources.

Options exist for more than 50MW of direct renewable and low carbon power, delivered through an adjacent 20 hectare site suitable for a solar array or fuel cells. An on-site combined heat and power energy centre has been given initial planning consent. Another sustainable power option is offered by a biomass power station at Ely.

Local atmospheric conditions are described as "a temperate maritime climate". The low, generally stable temperature and humidity are considered suited to ambient air cooling for data centres, according to ASHRAE (American Society of Heating, Refrigerating and Air conditioning engineers) definitions.

Cambridge is home to a variety of global technology companies, including ARM, Microsoft Research, Napp Pharmaceutical, The Wellcome Trust & Sanger Institute, University of Cambridge and the new global HQ for Astra Zeneca.

3.4.2 Dublin

Google is planning to expand its data centre footprint in Dublin with a new $200 million facility, reinforcing the city's status as a key hub for the world's cloud computing infrastructure. The giant search company may invest up to $300 million in the project, creating up to 300 construction jobs over a year or more and up to 60 new full-time jobs once it is operational.

In December, Microsoft announced plans for a $270 million expansion of its existing cloud hub in Dublin, where it has now invested nearly $1 billion. Microsoft is several kilometres down the road from Google's Dublin campus in Profile Park, where it completed a $120 million expansion in 2012.

Dublin is unique amongst major European data centre hubs in that its appeal is based on climate, rather than connectivity. While the thriving data centre communities in London, Amsterdam and Frankfurt are built atop network intersections in key business cities, Dublin has become one of the world's favoured locations for free cooling – the use of fresh air to cool servers. It is a prime example of how free cooling is giving rise to clusters of energy-efficient facilities in cool climates.

3.5 E-waste

Many countries have government or private or collaborative efforts to tackle e-waste on a sustainable basis. The Basel Convention, an international treaty, is designed to reduce the movements of hazardous waste between nations, and specifically to prevent transfer of hazardous waste from developed to less developed countries.

Australia's National Television and Computer Recycling Scheme involves a combination of government regulation and industry action to take responsibility for the collection and recycling of waste televisions, computers, printers and computer products. Under the Scheme, householders and small business can drop-off these items for free at designated access points, which may include permanent collection sites, take-back events or through a mail-back option.

In Canada, both "extended producer responsibility" (EPR) and "product stewardship" programs are used to manage products at their end-of-life. The main difference between the two approaches is that funding for the former is provided by producers while under a product stewardship program, legislated environmental

fees and/or public funds are commonly used as a funding base. Every province has an e-waste recycling program besides a national mobile device recycling program.

In the United States, at the federal level, legislation only addresses Cathode Ray Tubes and batteries. US states are active in this area, with Arkansas passing a law in 2001 to manage e-waste, including the power to regulate and/or ban the disposal of computer and electronic equipment in Arkansas landfills. E-waste in California may neither be disposed of in a landfill nor be exported overseas.

The state set global precedents by introducing an advance recovery fee funding in 2003 on all new monitors and televisions sold to cover the cost of recycling. There are also private schemes, which typically offer services to take back and recycle electronics, including mobile phones, laptop and desktop computers, digital cameras, and home and auto electronics. Popular schemes include those by Staples, Toshiba, Gateway, Panasonic, Office Depot, and Best Buy.

Europe has been an early leader in ewaste with some European countries implemented laws prohibiting the disposal of electronic waste in landfills in the 1990s. In Switzerland, since January 2005 it has been possible to return all electronic waste to the sales points and other collection points free of charge. The European Union has implemented several directives and regulations that place the responsibility for "recovery, reuse and recycling" on the manufacturer.

Notably, the Waste Electrical and Electronic Equipment Directive (WEEE Directive) has been transposed in national laws in all member countries of the European Union. The symbol adopted by the European Council to represent waste electrical and electronic equipment comprises a crossed out wheelie bin with a single black line underneath the symbol.

3.6 Natural environment

3.6.1 Public/private French water quality project

In the early 1980s, Vittel, a subsidiary of Nestlé Waters and a world leader in natural mineral water, was faced with the increasing rate of nitrates and pesticides level in an important artesian spring in the Vittel catchment in Lorraine in north-eastern France. The increased nitrate and pesticides rates were caused by leaching of fertiliser and pesticides from the maize fields, overstocking, and poor management of animal waste.

The only remedy available to the company was to establish an incentive scheme for farmers to voluntarily change their practices, which would essentially involve going back to extensive dairy cattle farming. Farmers were asked to give up maize cultivation for animal feed, and to adopt extensive cattle ranching pasture management by reducing carrying capacity, composting animal waste, giving up agro chemicals, balancing animal rations to reach optimal milk productivity and farm profitability, and by modernising farm buildings accordingly.

In return, farmers were provided with a long-term incentive package that included 18- to 30-year contracts; the abolition of debt linked with land acquisition; the acquisition of 1450 hectares of land which was left in common ownership and made available to farmers for up to 30 years; an annual subsidy of about 200 Euros per hectare over seven years to ensure guaranteed income during a transition period (which corresponded to about 75% of disposable income); the reimbursement of farmers' debt up to 150,000 euro per farm to invest in new equipment and buildings; free labour to apply compost in farmers' fields; and free technical assistance.

"Although protection of biodiversity was not the objective of the initial programme, in particular the new challenges as described above led the programme to incorporate practices that benefit biodiversity. For instance, herbicides have been replaced by thermal weeding in school yards, railroad tracks, airport

grounds, paths and parking lots. Some farms have turned to organic dairy production, and Vittel established 140 hectares of organic apple orchards."

The primary reasons for the success of the programme were not financial. The attention given to the complex interactions between technical, economic, social, legal, geographic, sociological and political issues (land market, debt cycle, labour constraints, future of farm family, role of farmers unions) was key to understanding farmers' livelihood strategies.

3.6.2 Global fisheries management study

In 2012, an international task force of marine experts published a **study** on the state of the ocean forage fish population and made comprehensive recommendations on how such fisheries can be saved.

"We have presented a comprehensive account of the vulnerability of forage fish to overfishing and collapse, of their ecological and economic importance in specific locales and globally, and of the measured and predictable responses of forage fish consumers to the exploitation of these fish," they wrote.

"It is clear from this compilation and synthesis that the management of forage fish needs to be much more cautious than standard past management guidance and practice, given the tremendous implications of forage fishing for the integrity of marine ecosystems."

3.6.3 Taranaki riparian exclusion programme

One of the world's **leading projects** to combat nutrient runoff into waterways has been developed in Taranaki by the regional council. The riparian exclusion programme is New Zealand's biggest environmental enhancement planting scheme on privately owned land. In 2013 it won the "Caring for our water" section of the Ministry for the Environment the annual Green Ribbon Awards.

The Environment Minister said the council placed high importance on monitoring the impact of this initiative, which generates information that can be used to educate the public about river water quality in the region. "Council land management officers identify fencing and planting requirements, estimate the cost of the work, and develop a programme for implementation." By June 2012, the council had worked with farmers to prepare nearly 2500 riparian management plans and nearly three-quarters of all waterways were protected.

3.7 Carbon pricing

The Trillion Tonne Communiqué is a **global call to arms** promoted by the Prince of Wales's Corporate Leaders Group and comes from "businesses who take the science of climate change seriously and are demanding a proactive policy response".

The latest report from the **Intergovernmental Panel on Climate Change** (IPCC) sets out the link between the cumulative total of greenhouse gases in the atmosphere and the resultant global climate change. It warns that if atmospheric emissions exceed more than a trillion tonnes of carbon from CO_2 then the global average temperature increase is likely to exceed 2°C.

"The risks of this level of climate change are too significant to ignore and The Communiqué draws out the implications of this by identifying three clear goals that a policy framework that keeps cumulative emissions below a trillion tonnes will need to deliver on."

"These goals have been chosen because of their ability to clarify the scale and nature of the transformation required. Over 1000 companies from more than 60 countries have signed up to at least one previous Communiqué."

In 2012, the Prince of Wales's Corporate Leaders Group released **The Carbon Price Communiqué**. In this statement business leaders make the case for a strong carbon price as a tool that can deliver appropriate carbon emission reductions.

"The Carbon Price Communiqué is open for **sign-up** alongside The Trillion Tonne Communiqué as a clear and transparent price on carbon emissions remains one of the main building blocks of a cost-effective, pro-business policy framework for climate change."

4. Policy Proposals

4.1 Boost clean energy and green technology

100% renewable generation by 2025: The Internet Party will adopt the goal of 100% of electricity generated from renewable sources by 2025. This will create jobs, economic resilience, strengthen our green reputation, and form a foundation for greater investment in green technologies. As a first step, the Internet Party will appoint a multi-disciplinary expert panel to build the economic case and strategic blueprint to achieve the 2025 goal.

A world leader in green technologies: The Internet Party will set a goal of New Zealand becoming a world leader in green technologies within five years. Best practices will be identified, targets set, policy congruence ensured, and increased priority given to government funding for research and development in green technology innovation. Linkages between academia, research centres, business and primary producers will be strengthened. An export target will be set of $4 billion annually from green energy expertise and technologies.

Direct resource extraction income into green energy research: The Internet Party will set up a transparent system which directs a proportion of government income from resource extraction into a contestable fund. The fund will promote research and development of new, renewed and alternative green energy using decentralised generation from wind, solar, hydrothermal, marine, geothermal, hydro and other sources.

4.2 Minimise harm from resource extraction

Moratorium on risky extraction and waste disposal: There will be an immediate moratorium on hydraulic fracturing, land-farming, deep-sea exploration, undersea mining and deep-well injection until the recommendations of the Commissioner for the Environment about these environmentally risky extraction industry processes are debated publicly and acted on by Parliament. The objective is to achieve a social mandate for processes that are safe, properly consented and monitored, and to ensure modern and environment-friendly methods – if they are available - are given greater priority as emphasis on fossil fuels is phased down.

Bond system for hazardous processes: If or when moratoria are lifted on environmentally hazardous resource extraction methods, a partially refundable bond system will apply to companies seeking permits and consents to ensure government, ministry and local government organisations have sufficient resources in hand to remedy damage from accidents, without having to rely on the legal or moral obligations of the extractors. A part of the bond funds will pay for world-class equipment to be held in New Zealand for immediate deployment in worst-case scenarios.

Restore public rights to protest and object: Section 100B of the Crown Minerals Act will be repealed to restore those concerned about the environmental dangers of offshore oil drilling the democratic right to protest. Transparency will be guaranteed in government and local government permit and resource consent application processes to ensure the public have a right to know what is being proposed and to make submissions. Such applications must be publicly notified, a reasonable period allowed for submissions, and public hearings before independent commissioners held where necessary.

4.3 Develop smart cities, homes and transport

Smart cities: The Internet Party will direct a part of the already committed central government funding of re-creating Christchurch to make it a world leading smart city. This will be done in collaboration with local government bodies and the people of Christchurch.

The Internet Party will encourage and work with other city councils in New Zealand to adapt the successes of Christchurch into their own technologically and socially advanced cities. For example, Wellington will be encouraged to become a carbon neutral capital like Copenhagen, and smart technology will be developed to ease Auckland's traffic snarls.

Smart homes: The Internet Party will encourage and support greater home automation and connectedness. The role of government will be to encourage inter-operability, review regulations, and promote benefits. The Internet Party will also launch one government-led project to demonstrate the possibilities and benefits of smart homes for elderly people living in their own home.

Smart electricity meters: The Internet Party will support and promote the accelerated roll out of smart electricity meters (not Automated Meters that only remotely report readings) across New Zealand. Effective steps will be taken to remove concerns people have expressed, such as strong privacy regulation to protect and clarify ownership of data, as well as providing scientific information to allay health concerns.

Smart transport: The country's land transport plan will be reviewed, with a primary objective being the encouragement and prioritisation of public transport, cycling and walking. Ways to enable people to work more from home with the use of modern communications and information technology will be encouraged and barriers addressed. The Internet Party will give priority to restoring New Zealand's rail system so that there is less pressure on roads from large trucks. Auckland's traffic control system will be reviewed. A light rail system will be built from Auckland Airport to the city centre.

4.4 Set up a green data centre

Inspired by the success of Dublin, the Internet Party will develop a futuristic, global-scale, green data centre in New Zealand using a public-private partnership model. The data centre will use 100% renewable energy. The Internet Party will attract and negotiate terms with one leading global Internet company to use that green data centre.

Conditions for a thriving Internet business ecosystem to develop around the green data centre will be encouraged, setting off a self-reinforcing cycle of attracting more global businesses and more green data centres in New Zealand. This would have the added advantage of increasing the country's outgoing Internet traffic, currently dominated by incoming data.

The green data centre policy requires success of other Internet Party policies including an additional submarine cable, stronger data protection laws, and a public undertaking that the government will not use secret interception capability orders.

4.5 Tackle ewaste

The Internet Party supports an accelerated introduction of a compulsory product stewardship scheme for electronic and electrical equipment under the Waste Minimisation Act. A level playing field is essential to ensure that all importers of such goods are required to contribute to a product stewardship scheme. During the period of time it takes for a compulsory product stewardship scheme to become operative, the Internet Party supports government-backed free "ewaste days" for collecting and disposing of ewaste responsibly.

4.6 Enhance environmental protection

The Internet Party will work with, and support, like-minded parties to develop common policies and approaches in protecting New Zealand's environment.

The Internet Party will advance the following views:

Biodiversity: Priority is given to the protection of New Zealand's biodiversity, especially native species. Current strategies used by the Ministry for the Environment, the Department of Conservation and other public and private bodies will be reviewed to produce a national 10-year Biodiversity Protection Plan that will be open to public submission and put in place by 2016.The review will include current bio-security and border protection practices.

Department Of Conservation: An immediate review of the Department of Conservation in terms of its resources, policies, strategies and future directions to ensure it has the capacity to protect and enhance New Zealand's conservation estate and maintain its relevance to the 100% Pure tourism brand.

Water quality: Current approaches being taken by government, local government and private organisations to remedy water quality issues will be the subject of a public review conducted by the Office of the Commissioner for the Environment. Public submissions will be encouraged and hearings held. The objective will be to produce a national 10-year Water Quality Plan by 2016, with a key aim the resolution of water environment issues linked to agriculture and industry by 2025. Recent changes to the Resource Management Act will be reviewed to ensure than environmental protection has not been diminished.

Marine fisheries: Priority will be given to detailed research into the extent of New Zealand's marine fisheries, the aim being the formulation by 2018 of a national plan for future exploitation.

Maui's Dolphins: As a critically endangered sub-species of Hector's dolphins, New Zealand has an obligation and responsibility to the world to act immediately and save it from extinction. The Hector's and Maui's Dolphin Threat Management Plan will be publicly reviewed with a view to create a genuine marine reserve (including banning oil exploration) covering the area where Maui's Dolphin are found and managing the risks from set netting and from fishing.

Pest control: Step up efforts to find methods that are more safe, effective and sustainable than the use of 1080 poison aerial drops to control the possum population.

4.7 Carbon Pricing

New Zealand urgently needs a strategy to achieve a net zero emissions economy. The Internet Party supports the Green Party's call for a 100% reduction in net greenhouse gas emissions from 1990 levels within New Zealand by 2050, with a two-yearly review of progress towards these national targets and technology incentives so the country can be kept up with the latest developments in science and technology. We also support the call for an international agreement that aims to reduce greenhouse gas concentrations to a safe level of less than 350 parts per million as soon as possible.

The Internet Party supports in-principle the Green Party's **climate protection plan**. According to the **BERL report** on replacing the Emissions Trading Scheme with an Emissions Levy, the increase in cost (dairy, electricity and fuel) for an average household will be $101 per year. The Internet Party proposes that the net tax revenue raised of $955 million per year is used for compensating the lowest income households for the increased costs, subsidising water quality remediation, other environmental initiatives contained in this policy such as the goal of 100% of electricity generated from renewable sources by 2025, and investment in transition from fossil fuels.