

Developing a New Zealand Energy Strategy

Response from The Sustainable Energy Forum Inc. (SEF)

The terms of reference for developing a New Zealand Energy Strategy (NZES) were publicly released on 4 July 2006, and we are now seeking stakeholder feedback on the questions set out below as input for developing the draft strategy over the next 2 – 3 months.

What will the NZES do?

- The NZES will take a long-term view out to 2050 that takes account of the challenges we face, and the options open to us.
- The NZES will identify priorities for the energy sector going forward to manage the risks. It thus needs to provide the flexibility to seize the opportunities – these are huge due to New Zealand's great renewable resource base, low population, and the extremely low efficiency of much of our existing stock of buildings and appliances, . The strategy will also provide clarity on the role of government and market actions to achieve these priorities. A critical question is: how will this clarity be achieved? The energy supply sector is at present driven by the interests and corporate goals of its individual participants, and the overlapping responsibilities and gaps of its government overseers and regulators.
- It will identify a plan of action to help reach our objectives - for example, policies to address greenhouse gas emissions in the energy sector.
- The strategic priorities should also help to identify key areas and direction for investment in energy innovation and efficient energy use.
- Stakeholder engagement on the development of the strategy will help to galvanise the action of government, industry and the community behind agreed priorities. Consumers and small-scale energy service providers will be treated as full stakeholders.

Questions for discussion:

The terms of reference emphasise the role of government in providing leadership for the energy sector to respond to the long-term challenges of energy security and climate change.

⇒ *Are these the main challenges that the NZES should focus on?*

Energy security and climate change are the main challenges that the NZES should focus on. The NZES needs to acknowledge the context of these challenges, which is that New Zealand's energy system is operating in an increasingly carbon-constrained environment. These constraints apply to both the supply of carbon - most urgently, to the supply of fossil oil - and to the ecosystem's ability to absorb the byproducts of the consumption of carbon. Therefore, the overarching task of the NZES should be to find a way in which an environmentally and economically sustainable energy system that can operate within these constraints can be created, maintained, and modified over time.

Note: An approach to mitigating climate change that focuses on lowering the levels of human-induced greenhouse gas emissions to sustainable levels, without incorporating human management of the natural carbon cycle, requires that severe carbon constraints be introduced into the energy system. An alternative proposal, which deserves further detailed investigation, is to adopt a holistic greenhouse gas management strategy that actively mobilises biosphere management, as proposed by Dr Peter Read of Massey University and others. This proposal contends that a least cost approach to mitigating climate change would involve the energy sector in accommodating a large supply of biomass raw material in lieu of fossil fuels.

⇒ *What do you think are the key questions that the NZES should be exploring?*

Preamble

Making decisions on the key questions requires good data. What are the data requirements and considerations to underpin supply and demand scenarios?

- Supply: quantities or reserves of conventional energy (petroleum, geothermal energy and coal) and new renewable energy including wind resources on a very detailed map grid, expected sawmill and forest residues throughout New Zealand, agricultural wastes at processing plants and in the field, sunshine hours.
- Demand: trends in passenger, light commercial and heavy freight transport, airline travel (domestic and international), and shipping (such as consolidation to certain major ports). Electricity, energy and peak growth, with discussion of causative factors. Trends in industrial/commercial heat supply: coal, wood, gas, electricity.
- Infrastructure: Where are growing areas of population; of industry; of commercial growth including motels and rest homes? Where has investment taken place, and where is more planned, in motorways, rail networks and public transport? Where is more investment planned in transmission? Where is more investment planned in distribution assets (which are critical to small-scale generation and price-responsive demand)? What are the implications of demographic change?

Overall, accurate energy end use data by sector is critical to enable relevant scenario modeling to be done.

Where data are commercially secret (as in much of the above!), how can Government require supply of data on the promise it will be aggregated to protect commercial interests?

Key questions

1) How can the present New Zealand energy system be changed over time so that it is sustainable and resilient within national and global environmental (especially carbon) constraints, and which supports sustainable economic activity within these constraints? What external and internal factors may affect the timing and nature of this change process? How can we make sure that every new proposal addresses the long-term strategic issues and is required to assist the transition to a sustainable energy future?

- 2) What can New Zealand learn from international experience in facilitating low-carbon strategies and energy efficiency, especially in the context of our restructured energy sector? Is international collaboration, for example by way of the IEA task forces on energy efficiency, demand side management and renewable energy, a useful and cost-effective way to avoid re-inventing the wheel?
- 3) What changes should be made during the next five years, and beyond, to meet the challenge posed by the approaching peak in conventional oil production? What opportunities are presented by the need to respond to this challenge, and what risks are posed? How can these changes best be integrated with the transition to a sustainable energy future? What steps can New Zealand take internationally to help minimise the economic and political risks posed by the approaching peak in conventional oil production?
- 4) Is it feasible to achieve complete independence from fossil carbon in the energy sector? If so, what is an achievable target date to achieve independence from fossil carbon for (a) the stationary energy and (b) the transport energy sectors? If not, how can the use of fossil carbon best be made emissions-neutral?
- 5) Looking at the period up to 2030, to what extent can, and should, New Zealand reduce its dependence on oil and upon other fossil fuels in (a) the stationary energy and (b) the transport energy sectors?
- 6) What is the scope to reduce energy demand by 2030, and can a policy of economic growth be maintained while reducing energy demand?
- 7) What methods and policy settings should be used to achieve the goals of the NZES; how can the effect of these best be modelled in advance of their adoption; how can their effectiveness be measured subsequent to their adoption; and how can the results of this evaluation best be used to modify the NZES so that it responds effectively to changing conditions?
- 8) How can energy policy be better integrated both internally - for example, in better integrating stationary with transport energy policies - and externally - for example, in better integrating energy, agriculture, forestry, and trade and aid policies?
- 9) What changes can be made to Government taxation, charging, and regulatory systems so that the economy as a whole is aligned with the goals of the energy system?
- 10) What opportunities are there to recycle Government revenue from the energy sector into activities that promote the increased sustainability of the energy sector? What opportunities are there to change the taxation system so that taxation falls more heavily on unsustainable activities, and correspondingly less upon sustainable ones? What distributional implications would such changes have, and how can these be handled in a way that promotes equity and social cohesion whilst not undercutting the transition to sustainability?
- 11) How can public consultation and engagement about the challenges and opportunities in the energy sector best be carried out?

12) How can the strategic implications of "transmission alternatives" and "non-transmission alternatives" be examined before options are foreclosed? In particular:

- Can the option be kept open for a high-capacity DC link from the South Island to a location north of the Otahuhu constraint, enabling (in principle) low-cost wind generation to supply electric vehicles in Auckland, and enabling electric vehicles to help integrate intermittent wind generation?
- To what extent would a partial phase out of household wood burning require extra investment in generation and transmission? Alternatively, to what extent would more efficient and less polluting household wood burning enable the deferral of generation and transmission investment?

Given the long lead times inherent in energy sector investment and planning, it's important that we act now to provide the confidence and right signals for investment in New Zealand's sustainable energy future.

⇒ *What are the foremost areas for investment in New Zealand's sustainable energy future?*

Preamble

The Government response to perceived or actual crises in the energy sector has often been to "pick winners": that is, to choose to make substantial investments of public money in one or a few major projects. The "Think Big" schemes of the 1970s are a classic example. This process of "picking winners" has had limited success, and has often foreclosed what might have been better options, had they been given an equal chance to succeed. (Picking winners should be distinguished from picking appropriate technology types to meet certain goals, such as bioenergy and carbon storage in relation to holistic greenhouse gas management.) Therefore, it is important that the Government adopt broad strategic goals, along the lines suggested above, and then provide the right environment and the right incentives to encourage innovation to meet these goals.

The Government has crucial roles to play in encouraging research and development in sustainable energy technology types and policies on both the supply and demand sides; in providing the right balance of incentives and disincentives to encourage changes in the direction of sustainability and reduced dependence on fossil carbon; and in providing support, including government purchases, to allow promising emerging technologies to reach a 'critical mass' of availability and distribution in New Zealand which will give them the opportunity to compete in the marketplace.

Investment in human capital is as important as investment in energy supply. A base of skilled tradespeople and energy auditors is essential to implementing the vision of a sustainable energy future.

Specific investment priorities

1) Building forecasting, modelling, data collection and evaluation, and scenario-building capacity which will allow New Zealand's energy system and policies to respond promptly and appropriately to short-term and long-term challenges and opportunities.

- 2) A research and development strategy, with key foci including issues related to New Zealand's natural advantage in renewables and distributed generation systems, and how they can best be integrated, along with land use improvements, into the achievement of climate change objectives; a secure and sustainable electricity distribution system; and the overall provision of energy services.
- 3) Demand management in both the stationary and transport energy sectors.
- 4) Transport modes and activities that depend least on fossil carbon. In particular, meeting the increased demand for public transport in our major cities in the least carbon-dependent way possible, and removing the barriers to the movement of an increased proportion of freight by rail and sea, where such mode changes can be shown to reduce fossil carbon dependence.
- 5) Improved management and information technology in the energy sector. Examples include net metering, integrated public transport ticketing systems, better real-time information to public transport users, and better load management within the electricity system.
- 6) Setting up or supporting pilot schemes, of a size sufficient to provide meaningful data, for a range of sustainable energy technologies to evaluate their effectiveness in and appropriateness to New Zealand conditions. Examples might include plug-in hybrid or all-electric vehicles, tidal flow or wave electricity generators, a range of microgeneration and cogeneration technologies, and use of biomass and solar energy directly for heating.
- 7) Where the results of such pilot schemes are positive, providing support to allow such technologies to reach a 'critical mass' of availability, infrastructure and expertise which will enable them to compete successfully in the marketplace - as was done for wind energy by the PRE process, and as is currently being planned for solar hot water heating. An extension of, or equivalent to, the PRE programme is needed to facilitate the development or growth of such technologies as efficient wood-burning home heaters and commercial and industrial furnaces and microgeneration.
- 8) The adoption of appropriate new sustainable energy technologies for the Government building stock and vehicle fleet.
- 9) Because householders today are treated as passive consumers uninterested in adapting their energy use to meet the increasing real costs, both financial and environmental, of energy supply, and because current policy settings address mainly large consumers on the unfounded assumption that they offer the most cost-effective energy savings opportunities, the genuine suffering of many householders due to rising energy bills needs to be addressed with energy audits, financial assistance for investment, and energy prices and tariffs that allow them to reduce their energy bills.
- 10) Training programmes to produce the professionals and skilled tradespeople needed to implement the outcomes of these investment priorities. These training programmes need to be set up early enough that the demand for the installation or distribution of new or scaled-up sustainable energy technologies can be met.

The strategy is committed to promoting energy efficiency and renewable sources of energy and will complement the objectives of the National Energy Efficiency and Conservation Strategy.

⇒ *How can the NZES contribute to the improvement of energy efficiency and use of New Zealand's renewable energy sources?*

1) How can we facilitate and implement energy efficiency and energy services in energy markets? Significant problems include:

- There is no clear owner of Demand Side Management issues
- Energy use per capita is high
- The cost of electricity is rising and people are finding it harder to pay the bill
- There is a lack of awareness of successful Demand Side Management programmes in other regimes.

2) What policy is needed to get high efficiency (non polluting) domestic and commercial biomass fired furnaces into buildings in NZ?

3) What mechanism is needed to support and help implement distributed renewable energy generation resources?

- Can a single mechanism cover distributed generation and pellets?

4) How can effective Demand Side Management and energy efficiency be included in the Building Code?

- Should the Government role be establishing the policy & forcing all players to comply / produce and document "efficiencies" achieved?
- Should a SOE be dedicated to implementation of such a program?

5) Governance of the electricity and gas sectors is controversial today:

- The incentive of electricity and gas suppliers to promote sales is against the interests of energy efficiency. Regulation of monopoly businesses assigns high values to assets (e.g. transformers, meters) that desperately need to be replaced. How can such incentives be improved?
- How can we overcome the conflicts and gaps in today's energy institutions: notably the Electricity Commission dominating "electricity efficiency" with EECA left with a less coherent responsibility? "Warm Homes" are being funded by EECA, MFE, and local trusts and regional council, yet the large majority of householders are unable to access such programmes