5 October 2009

The Executive Director
National Infrastructure Unit
The Treasury
PO Box 3724
Wellington

EECA submission on the 'Infrastructure: Facts and Issues' paper

The Energy Efficiency and Conservation Authority (EECA) is a Crown entity established by the Energy Efficiency and Conservation Act 2000. EECA's mission is to encourage, promote and support energy efficiency, energy conservation and the use of renewable sources of energy.

This submission summarises the strategic rationale for energy efficiency and renewable energy infrastructure, outlines priority areas where infrastructure needs to change; and, where appropriate, comments on the policies that could be used.

The current 'Infrastructure: Facts and Issues' paper does not articulate a strategic rationale for energy efficiency and renewables and only makes only passing references to climate change. This is despite extensive international literature (and domestic policy) stressing the importance of infrastructure, technology and behavioural changes required to face the challenges of an increasingly competitive and carbon/energy constrained world.

However, the Facts and Issues paper does discuss many sector specific issues that could support energy efficiency and renewable energy outcomes (e.g. efficient road funding and pricing, efficient transport planning and urban form, and future redevelopment of the electricity system).

Consistent with stated government policy, EECA considers that the National Infrastructure Plan should strongly emphasise the strategic importance of improving the nation's energy efficiency and renewable energy infrastructure. It could usefully reinforce this through principles guiding future infrastructure development.

The case for fostering energy efficient and renewable energy infrastructure

The government recognises that an efficient and increasingly renewable energy supply infrastructure is necessary to underpin our economic, environmental and personal wellbeing.

Accordingly, government energy policy places high priority on improving energy efficiency and the uptake of renewable energy. This will be reflected in the forthcoming updates of the New Zealand Energy Strategy and New Zealand Energy Efficiency and Conservation Strategy. This is expected to include a proactive role for government in fostering energy efficiency which extends beyond the creation of fair and efficient energy markets.

Government climate change policy also places considerable emphasis on the role of emissions trading (para 97), coupled with the roll-out of complementary measures to tackle non-price barriers to the uptake energy efficiency and renewables.

The efficiency of use is embedded in the fabric of physical infrastructure deployed across all sectors. Furthermore, the future energy efficiency of the transport system, electricity generation, buildings and industrial processes are largely determined at the time of their construction. Thus, short sighted development of such infrastructure may result in a long legacy of energy inefficiency which can undermine economic growth and New Zealanders' quality of life for generations to come. It is important to foster capital investments in energy efficient infrastructure which will reduce the ongoing energy operating costs of businesses and households.

Energy inefficient infrastructure also increases our exposure to future risks (e.g. New Zealand may need to cut greenhouse gas emissions more vigorously and respond to increasing international energy prices).

Increasing renewable energy supply is widely seen to: improve security of supply for current and future generations by diversifying New Zealand's generating base; reduce greenhouse gas emissions[1]; contribute to the renewable electricity target[2]; utilise non-finite resources, reduce exposure to supply disruptions and price fluctuations; and develop a sector of the economy which is strategically important.

Deploying energy efficient and renewable infrastructure can be a major source of comparative economic advantage – if we can keep ahead of international trends. Most developed countries, and many developing ones, already have strong energy efficiency and renewable energy deployment programmes. Having a small energy related carbon footprint will also allow our businesses to remain competitive in the face of increasing pressure from climate aware tourists and emissions sensitive buyers of our agricultural products.

Energy efficient infrastructure will also allow businesses to reduce their exposure to any emissions based duties imposed by our trading partners.

New Zealand requires better access to energy efficient and renewable energy technologies embedded in our infrastructure at the time of new construction and when major refurbishments or retrofits are undertaken. However, retrofitting new technologies is generally more costly, less effective and slower to implement. It is much better to make use of appropriate technologies from the start. Most of the technologies that can make a dramatic difference to New Zealand's energy use over the next 20 years are already available.

In practice we need to simultaneously make better use of existing infrastructure and to invest in new more energy efficient and renewable energy infrastructure.

[1] Electricity related greenhouse emissions have increased 90% since 1990.

[2] The target is to have 90% of electricity generated from renewable sources by 2025, providing it does not undermine security of supply.

Priority areas for energy efficient and renewable infrastructure development
EECA considers that the National Infrastructure Plan should reflect government priorities by including an explicit focus on creating the necessary and sufficient conditions required to create more energy efficient and renewable:

Buildings and industrial processes by……

- providing minimum standards, incentives and information to construct energy efficient and low emissions commercial and residential buildings[3]. Publicly owned/operated buildings and facilities also need to be energy efficient to ensure that government gets value for money from its energy inputs, while minimising emissions.
- installing energy efficient industrial and manufacturing processes which utilise renewable energy resources and waste-streams.

Energy supply and demand management infrastructure by…….

- developing energy efficient and renewable electricity generation, transmission[4] and distribution systems – including distributed renewable supply embedded in local communities.
- developing more marine, wind, geothermal, hydro, solar and biofuels supply systems of various scales, coupled with end-use technologies such as smart meters.
- ensuring that the National Infrastructure Plan relates clearly to existing energy related policies, plans and functions of central and local government (e.g. the National Policy Statements on Electricity Transmission; the Proposed National Policy Statement for Renewable Electricity; regional policy statements; regional council function under the RMA for integrated infrastructure provision; and regional land transport strategies).
- recognising the significant potential for renewable energy generation, including new baseload geothermal generation, new hydro and wind generation (see EECA's Regional Renewable Energy Assessments which identified major resources in 13 regions: http://www.eeca.govt.nz/central-and-local-government/local-government/renewable-energy-planning-resources and the marine energy potentials report http://www.eeca.govt.nz/node/6123).
- recognising linkages to the infrastructure related aspects of the Phase Two reforms under the Resource Management Act and related outcomes of the Electricity Market Review.
- reinforcing the need to address remaining regulatory barriers to the deployment of renewable energy.

Transport and urban form by……

- increasing use of marginal and cost reflective fuel and road pricing (including the introduction of a market price on greenhouse gas emissions and other externalities). This should aim to optimise contributions from both transport supply and transport demand management projects.

[3] In the residential sector there are particularly large tangible energy cost saving and health benefits from insulation and long lived clean space and water heating devices.

[4] See the Electricity Commission's report on transmission issues to enable renewable energy generation http://www.electricitycommission.govt.nz/opdev/transmis/renewables1#final-report-on-the.

- optimising the development of road transport infrastructure. This includes use of next generation technologies (e.g. intelligent traffic management systems; real time road pricing and information to road users on road conditions and parking availability) and facilitating better interconnections to other modes – particularly rail and costal shipping. Decongestion of roads needs to happen in tandem with the active development of alternative personal access and freight options, given that “building our way out of congestion is unlikely to be an affordable or efficient strategy” (para 45).
- progressively introducing electric vehicles running on renewable electricity and biofuels and associated provision of underpinning facilities (e.g. recharging infrastructure and storage for ethanol-petrol blends).
- facilitating use of larger trucks as part of an integrated approach which also harnesses the optimal contribution of competing freight modes (e.g. coastal shipping and rail)
- encouraging energy efficient urban form, through a range of measures including:
    - higher density mixed land use with limited urban sprawl - which will reduce the need to travel to work, recreational sites and other public amenities. This needs to be linked to greater provision of energy efficiency optimised road infrastructure and vehicles, and serviced by increasingly renewable energy powered public passenger transport and freight networks.
    - energy efficient subdivision design – including the orientation and spacing of buildings to take advantage of natural heating and cooling
- encouraging distributed electricity generation and local energy supply when buildings/facilities are constructed and retrofitted (e.g. use passive solar building designs, local wind and biomass waste streams geared to meet individual or community energy demands).
- minimising energy use embodied in the urban infrastructure (including the exercise of wise choice of materials and the design of buildings) ; minimising waste to landfill; and use of waste products to generate energy (e.g. landfill gas, use of waste oil and biomass).
- developing infrastructure to support cycling and walking.

On addition, as touched on in paragraph 98, greater deployment of telecommunications (including high speed broadband) should enable the use of low energy and emissions alternatives to physical transport (e.g. telecommuting, work from home video-conferencing, remote monitoring, shopping via internet). It can also facilitate better use of the existing infrastructure (e.g. through remote building monitoring, better transport demand management, and better integration of electricity supply and enhanced consumer demand in response to price signals).

Conclusions
The physical infrastructure of buildings, transport systems, electricity generation, buildings and large industrial processes creates an energy supply and end-use legacy for generations to come.

Having energy efficient and renewable energy supply and end-use infrastructure is strategically important to:

- support the future productive capacity, international competitiveness and economic viability of our businesses – by keeping energy costs low, while still incentivising optimal use of infrastructure and energy resources
- directly improve the quality of life of New Zealanders – e.g. by keeping energy services affordable and using insulation and clean heat to improve health
- manage future energy price rises and energy security risks – particularly the likelihood of rising costs of greenhouse gas emissions mitigation, and increasing world energy prices as a result of fossil fuel depletion and volatile oil markets
- improve environmental performance – by reducing greenhouse gas emissions (in line with our international obligations) and improve local air quality

Consistent with government policy, strategic infrastructure planning should explicitly be seen to underpin, incentivise and guide the rapid roll-out of energy efficient and renewable energy supply and end-use technologies. Increasing the availability of energy efficient alternatives (e.g. public transport, highly energy efficient buildings) will also make it much easier for people to change their behaviours in response to efficient market based energy, carbon (emissions trading) and road pricing signals.

It is not sufficient just to have infrastructure in place at the right time. It is strategically critical that the infrastructure is also of high quality – to make efficient use of our valuable energy resources. This is an issue of national strategic significance.

I would appreciate an opportunity to discuss these issues with you personally.

Yours sincerely

Walt Friedel
Manager Government and local Government
Energy Efficiency and Conservation Authority

Initial EECA contact for enquiries:

Faust Bovenlander
Principal Analyst
Energy Efficiency and Conservation Authority
(04) 495 8260
faust.bovenlander@eeca.govt.nz