

3 June 2015

By email

The Energy Management Association (EMANZ) welcomes the opportunity to submit on an appropriate target for New Zealand to commit to in international negotiations later this year.

Established in 1993 and now with over 350 members, EMANZ represents the New Zealand energy services sector, those businesses and individuals with a professional interest in New Zealand moving to a more affordable, secure and sustainable energy future.

Over many years EMANZ members have been responsible for delivering a significant proportion of the energy performance improvements undertaken by New Zealand businesses and residences, and, working in concert with the Government through EECA, have played a key role in the successful delivery of the Government's energy efficiency initiatives.

EMANZ vision is *"To make New Zealand's energy productivity world class"*.

This is actioned through accreditation of EnergyMasters professionals specialising in various energy using technologies (process heat, refrigeration, compressed air systems etc), and methods such as energy auditing, and measurement and verification of energy performance to internationally recognised standards.

In conjunction with Enviro Mark, EMANZ has recently established Energy Mark - a business certification scheme that demonstrates businesses are managing their energy to internationally recognised standards.

EMANZ also provides a range of practitioner training courses in energy management, from introductory to highly specialised areas.

## **Summary**

- The largest contributor to reducing New Zealand's energy emissions with respect to 1990 levels and international commitments historically and for the foreseeable future is energy efficiency.
- Unlike the measures outlined in the consultation document, energy efficiency investments save money, and have a range of co-benefits that make them highly valuable to improving New Zealand's welfare while contributing to New Zealand's (and potentially global) emissions reductions.
- New Zealand has historically improved its energy efficiency (intensity) at 1% improvement per annum, but this could be more in line with other major trading countries such as China, the US and Canada at 1.5%. This submission however focusses on improving New Zealand's energy productivity, which EMANZ believes

to be a more useful index.

- Opportunities to improve New Zealand's energy productivity through investments in energy efficiency are continual through the technological improvement, and New Zealand's domestic policies should be strengthened through a greater focus on improving energy productivity.
- While New Zealand is largely a technology taker in energy efficiency, our strength lies in the application of those technologies through having domestic energy markets with, relative to most countries, clear price signals (few cross subsidies and well regulated) along with high standards of engineering and technical practice. This sets an excellent context from which we can capture global opportunities.
- With all of the above, New Zealand has all the elements needed to capture a business opportunity to become a global solution provider in improving energy productivity.
- As suggested by some commentators, policies that support improved energy productivity in New Zealand do not harm our transition to a clean renewable energy future, and a reduction in emissions via that route. Being more productive with our energy sets the country up for growth, and that growth can be met with clean energy. Policies that improve energy productivity strengthen our economy through making New Zealand a cleaner, more competitive country for producing goods and services for domestic and international consumption.
- The largest cost effective opportunities for emissions reduction lie in the transport, industrial and commercial buildings sectors and each of these areas needs specific domestic policies with specific targets and actions for achieving them (outlined later in this submission). Policies such as:
  - Transport: accelerate the switch to electric vehicles, starting with hub spoke users such as buses, taxis, couriers and trucks,
  - Industrial sector: Support the move to more efficient process heating systems away from coal,
  - Commercial sector: In line with our trading partners, move to mandatory energy labelling for commercial office buildings (NABERSNZ),
  - Overall: Continue to build capacity and capability in our application of energy using technologies in the transport, industrial and commercial building sectors.
- All that said, the agriculture sector are being subsidised for their emissions by the taxpayer in two main ways, which is in conflict with current policy principles of user, or beneficiary, pays. Not only are the agriculture sector free riding for their emissions, but the Government is using taxpayers money to fund emissions reduction research for their benefit.

It is high time the agriculture sector, at least partially, covered the cost they are imposing on New Zealand taxpayers for their emissions, so there is some incentive on them to act in New Zealand's interests along with their own.

## Focussing on the Right Thing: Energy Productivity

According to the IEA (energy efficiency markets report 2014),

*“energy efficiency represents the most important plank in efforts to decarbonise the global energy system and achieve the world’s climate objectives: in the IEA scenario consistent with limiting the long-term increase in global temperatures to no more than 2 degrees Celsius, the biggest share of emissions reductions – 40% – comes from energy efficiency.”*

The cNew Zealand’s improvement in emissions intensity to date has been achieved almost entirely through energy efficiency. There has also been some small structural change in the economy over that period<sup>1</sup>.

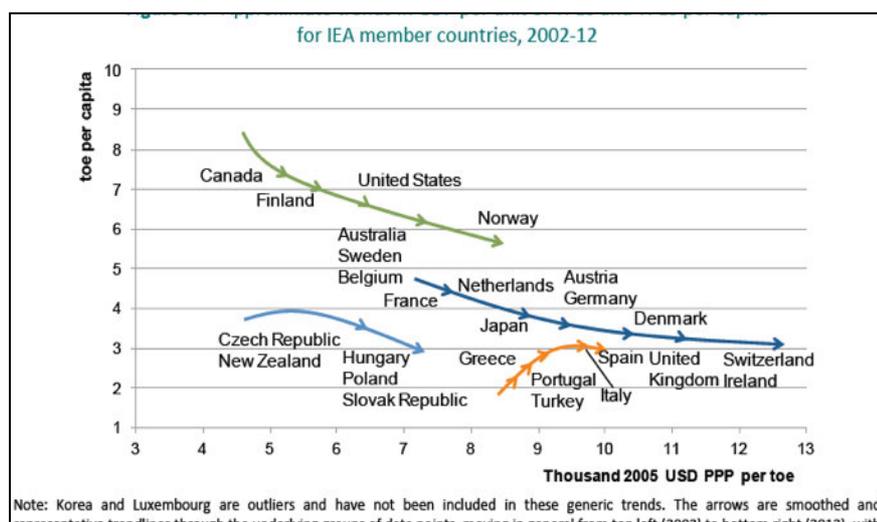
The country’s energy efficiency (intensity, which includes structural change) has been improving at a creditable rate of 1.0 per cent per annum. This is a better than average performance relative to peers: Australia merely achieved 0.1 per cent. However, New Zealand has not been a leader in the field, with Canada, the United States and Germany all achieving significantly faster rates of improvement, closer to 1.5 per cent per annum<sup>2</sup>.

However a number of governments are seriously looking at how energy efficiency can contribute to their social and economic aspirations in a post-global financial crisis world. Chinas latest 5 year plan for example has stipulated over \$100 billion be spent on investment in energy efficiency.

There is a growing recognition of:

- the multiple social and economic benefits of energy efficiency,
- it’s contribution as the ‘first fuel’ for economic and social outcomes in IEA member economies,
- a move to a more expansive paradigm for energy efficiency than just ‘saving energy’.

IEA Member countries respective energy productivity improvements from 2002 to 2012 are shown below (Source: IEA 2014 energy efficiency markets report).



<sup>1</sup> “Green Growth: Opportunities for New Zealand” Final Report. Nov 2012, Green Growth Research Trust.

<sup>2</sup> Energy Efficiency Markets Report 2014, International Energy Agency (IEA)

The chart above shows New Zealand, while having fairly low energy usage per capita relative to some other IEA countries, does not earn as much from its energy as others. In short, New Zealand has a long way to go in matching its peers in energy input to GDP output.

New Zealand risks being left behind in terms of energy productivity, if we do not continue with policies that support investment in energy efficiency. This could have the impact of increasing global emissions through the production and international trade of goods and services from more energy productive but less clean/renewable as New Zealand.

The IEA estimates that the global market for energy efficiency is now around \$310-360 billion per annum. Having a strong domestic market for energy efficiency services driven off a platform of relatively uncluttered energy price signals and strong resource of engineering practitioners, New Zealand could, under a supportive suite of policies, punch above its weight in this global market.

## **ANSWERS TO QUESTIONS**

1. *(a) Do you agree with the objectives for our contribution? (It should be seen as a fair and ambitious scheme both internationally and domestically. Costs and impacts on society are managed appropriately. It must guide New Zealand over the long term in the global transition to a low emissions world).*

EMANZ supports the idea that New Zealand should set fair and ambitious targets, and that costs should be managed appropriately, and guide us over the long term.

As objectives however, these are very difficult to measure and therefore not particularly helpful. As a general comment on fairness, EMANZ believes future generations must be central to this consideration, that is, we should not leave it for future generations to suffer the consequences of our inactions.

New Zealand currently has very high emissions per capita compared with other countries. Under the current Convention New Zealand has a current unconditional target to reduce emissions 10-20% below 1990 levels by 2020.

This year the European Union has set an INDC target of 40% emissions reductions by 2030.

In committing to its own INDC, New Zealand should match that of the European Union. If not we will continue to be tarred with the brush of being a Climate laggard, hurting our international clean green reputation, as well as continuing to miss out on the significant international business opportunities from other countries investments in energy efficiency (see below for estimates of the size of global energy efficiency market).

On page 11, the document makes an unsupported claim that New Zealand cannot achieve as much as the European Union. The evidence with respect to energy productivity does not support this statement. New Zealand has been improving at 1 percent per annum in terms of energy intensity, where our trading partners such as Canada and the US have recently been improving at 1.5 percent (Australia 0.1%). With a reasonable record to date, New Zealand's flexible economy would not have to do much to reach improvements of 1.5-1.8%.

We have got ample room to improve our performance under the right conditions.

*(b) What is most important to you?*

It is very important to EMANZ and our members that New Zealand pulls its weight internationally.

It is also important that those businesses in New Zealand who have aligned themselves with a low emissions future are given the opportunity to capitalise, and those that have not pay accordingly.

With a global market in energy efficiency of \$350 billion per year, New Zealand is in the envious position of being able to contribute not just domestically, but also to use our skills to assist other countries to reduce theirs.

2. *What do you think the nature of New Zealand's emissions and economy means for the level of target that we set?*

This MfE consultation document has highlighted that there are uncertainties in future technologies. While this is correct, a pragmatic approach should be to take a risk management approach, and establish measures that manage the key risks to New Zealand achieving its target.

EMANZ believes the most pragmatic risk based approach is to focus primarily on getting the most out of our energy as a priority, and transitioning to a clean energy future where practicable i.e switching to electric vehicles. This way we are less at risk of greenhouse gas emissions becoming a cost burden.

3. *What level of cost is appropriate for New Zealand to reduce its greenhouse gas emissions? For example, what would be a reasonable reduction in annual household consumption?*

While it is essential to consider the costs of abatement, the negative costs (benefits) are equally important and this consultation document, doesn't appear to adequately address these in any way. EMANZ recommends the MfE consider the IEA report "*The Multiple Benefits of Energy Efficiency*<sup>3</sup>" as a starting point to address this shortcoming.

The annual cost savings from efficiency improvements should form part of any modelling to assess the value of New Zealand's climate change response. EECA currently estimate that there are currently cost effective opportunities to improve New Zealand's energy use in the order of \$2-3 billion per year. Policies that facilitate uptake of these opportunities beyond current policies should be seriously considered.

The cost of doing nothing, including the damage to national infrastructure, international reputation and insurance premiums, should also be included in the analysis.

4. *Of these opportunities which do you think are the most likely to occur, or be most important for New Zealand?*

The significant opportunities for New Zealand (in priority order) are as follows:

- a) Accelerated transition to electric vehicles,

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<sup>3</sup><http://www.iea.org/newsroomandevents/pressreleases/2014/september/energy-efficiency-a-key-tool-for-boosting-economic-and-social-development.html>

- b) Reduced industrial and manufacturing emissions through improved energy productivity and transition to renewable heat sources
- c) Improved commercial building energy performance,
- d) Increased planting of forestry sequestration
- e) Clear incentives on agriculture through some level of apportionment of the cost to New Zealand of their emissions.

The section below gives an outline of what policies should be implemented to improve the transition in each of these areas.

5. *How should New Zealand take into account the future uncertainties of technologies and costs when setting its target?*

As mentioned above, New Zealand should take a standard risk management approach to the future Identify the key risks and uncertainties, put measures in place to either manage them or understand what we should do if the uncertainty unfolds against us.

Uncertainty is everywhere, businesses and governments face them all the time. The uncertainties mentioned are no different, and are certainly not an excuse to do less.

Being more energy efficient as a first priority is the most pragmatic approach given we know where the opportunities are, the cost of them, and that they improve our competitiveness.

The technological advancement in areas such as solar electricity, (PV) and complementary technologies such as batteries are creating large uncertainty in electricity markets globally. New Zealand does not subsidise PV, yet uptake will continue to accelerate.

While they are currently on the top of the “hype curve” it is widely accepted that these and other innovative (disruptive) technologies will create a paradigm shift in both stationary and transport electricity systems and markets globally over the next ten to fifteen years.

This only adds weight to the opportunity in front of New Zealand to create a clean energy future domestically, and to capture international opportunities deriving from countries pursuit of more sustainable and potentially cost effective energy solutions.

These technologies also makes the likelihood that New Zealand will reach 100% renewable electricity by 2030 almost an inevitability, although future industrial electricity use does create some uncertainty in this.

#### The Rebound Effect

New Zealand’s electricity system is largely renewable, and future generation options are also predominantly renewable (see comment on solar electricity and batteries above). The transition to increasing renewable electricity is, in the short term, slowed by the fact that demand for electricity is not increasing, and so there is no need for investment in renewables to meet growth, only to replace end of life generation.

Assuming all else is equal, the rebound effect (buy a more efficient car and drive it more) assumes that because NZ is more efficient, we will ultimately produce more of the worlds goods and services. Given our relatively clean electricity system, this may

not necessarily be a bad thing. There is however, little evidence that the rebound effect actually occurs in practice<sup>4</sup>.

Overall, the Government is at risk of enhancing uncertainty and insecurity with an indefinite target and policy package. EMANZ encourages the Government to establish a clear policy that demonstrates New Zealand's serious commitment to reducing its greenhouse gases.

### **An Outline of a Possible Domestic Policy Package**

An ambitious target that is not based on or supported by a credible action plan is not likely to be achieved. The consultation document does not mention or outline such a plan.

The key areas of opportunity for New Zealand have been stated above. Below is an outline of what policies and actions EMANZ believes should be put in place to drive New Zealand beyond business as usual.

EMANZ would support further public consultation on any NZ climate change action plan to give confidence to the Government of its validity but the areas outlined below are what EMANZ believes should be the core components of a domestic response package.

#### a) Transition to electric vehicles

In terms of co-benefits, accelerating uptake of electric vehicles would, in time, have the effect of dramatically improving a key economic performance indicator - New Zealand's balance of payments, through domestic production of "relatively clean" fuel for our transport fleet, rather than importing "dirty" oil. This is potentially a double positive as it would also remove the need to purchase international emissions reduction units from offshore.

It is EMANZ understanding that "light" electric vehicles currently operate without the need for road user charges. This policy could be extended to the heavy vehicle fleet to encourage New Zealand's freight industry to switch to clean domestic electricity as its fuel source.

A status quo policy of continuing to support the uptake of electric vehicles through continuing the "no road user charges" approach could be complemented by a business education programme to ensure businesses were aware of the cost effectiveness of moving to electric vehicles.

A transition policy could also require Government vehicle fleet managers to begin trialling electric vehicles and sharing information with a view to transitioning to the most cost effective and fit for purpose electric vehicle solution.

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<sup>4</sup>*The Rebound Effect and Energy Efficiency Policy*, Kenneth Gillingham, David Rapson, and Gernot Wagner, October 28, 2014

The obvious area to start would be in hub and spoke transport systems such as couriers, taxis and buses, where overnight charging would be straightforward.

A key risk area to manage would be to ensure electric car batteries were recycled. Establishing an economy scale international agreement with a country like South Korea (who have plant capable of recycling electric automotive batteries) to take care of this risk should be considered.

- b) Reduced industrial and manufacturing emissions through improved energy productivity and transition to renewable heat sources

### Refrigeration

Refrigeration is a key energy use in New Zealand. Exports are 25% of GDP, 50% of exports are food, and half our export food is refrigerated. Through technological advancements (heat pumps allow and improved application the opportunities to cost effectively improve New Zealand's industrial and commercial refrigeration efficiency is significant - currently in the order of 30-50%. This is possible through<sup>5</sup>:

- super insulation
- application of variable speed drives/fans
- Improved heat exchangers
- Improved ventilation, defrost and compressor capacity controls
- Different refrigerants (ammonia, CO<sub>2</sub>, hydrocarbons)
- High efficiency lights, fans, compressors
- Phase out of open cabinets
- Improved controls.

The conversion to natural refrigerants (such as ammonia) brought about through international treaties to which New Zealand is a signatory, creates an impetus for change and a need to gear up for the shift to high efficiency but increased flammability refrigerants.

Europe is in the process of increasing its refrigeration compliance requirements that include some key New Zealand exports. This compliance change includes lowering the storage temperature requirements by 2 degrees celsius. Clearly this will have a cost implication on New Zealand exports. There is therefore an opportunity for a policy to focus on improving the efficiency of New Zealand's commercial and industrial refrigeration systems.

A targeted policy that focussed on accelerating the transition of New Zealand's commercial and industrial refrigeration to a more efficient and sustainable future would be very timely for climate change, productivity and international reputational reasons.

### Process Heat

A large proportion of New Zealand's industrial and manufacturing sector still use coal as a heat source.

Significant scope for improving efficiency of heat plant remains while carbon prices have no significant cost impact i.e. the carbon externality continues to be underpriced.

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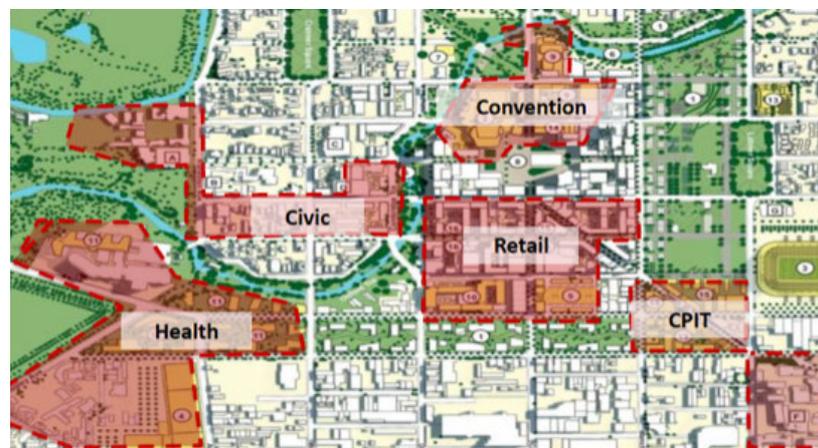
<sup>5</sup> Source: Professor Don Cleland, Presentation to EMANZ conference, May 2015

Transitioning this heat plant to renewable sources such as wood and bio-waste is unrealistic as a short term measure but may well become viable from 2020, depending on the international price of carbon and coal.

At a smaller scale level, the pending Christchurch District Energy Scheme shows what is achievable with a clear plan.

The picture below depicts the “hub concept” of the current Christchurch District Energy Scheme. This hub concept allows development of district energy in sync with redevelopment. A Joint Venture Alliance has been established and individual business classes for each hub are currently under development.

The scheme is scalable and flexible, utilising adaptable boiler technology that allows use of the aquifer temperature through industrial scale heat pumps, conversion of coal boilers to wood waste and straw



Source: Grant Smith, Pioneer Generation, “*Designing an Energy Scheme for a Rebuilt City*” presentation to EMANZ 2015 conference, Acting Global

### c) Improved commercial building energy performance

While improvement in the energy performance of New Zealand’s commercial buildings is beginning to happen, there are still major information barriers that preclude the improvements being experienced in Australia over the last five years.

Optimal decisions on energy performance in commercial buildings will occur when people (landlords, tenants and investors) understand where they sit on the performance curve.

Australia, Europe, almost all major cities in the US and Canada have implemented mandatory energy performance ratings for buildings. New Zealand is now one of the few developed countries without this legislation.

New Zealand has had a voluntary energy performance rating tool for office buildings, NABERS NZ, since 2013. This tool is effectively synonymous with the rating tool in Australia. Given the high degree of cross Tasman portfolio ownership in commercial building, the move to a mandatory energy performance rating tool for office buildings in New Zealand would be largely viewed as a catch up with Australia, providing much needed tool to reveal the extent of wasted energy in this sector.

d) Increased planting of forestry sequestration

While this area is not EMANZ members core business, the opportunities for transforming marginal farmland to forestry has been recently estimated by Scion at over 1.2 million hectares and this opportunity should be included in MfE's analysis.

e) Clear incentives on agriculture through some level of apportionment of the cost to New Zealand of their emissions.

The taxpayer is currently paying for the agriculture sectors emissions. The taxpayer is also paying for research into solutions to agricultural emissions. The energy sector has been paying its way since 2009.

Some redress is essential if New Zealand is to maintain any international credibility. Having a low carbon agriculture sector ahead of our trading partners would be a strategic point of difference, and reduce risks of international trade barriers.

### **Other Comments**

EMANZ recommends the total funding allocation for EECA Business is increased from \$13 million to \$20 million per annum. Otherwise EECA risks becoming more of a distraction than a contributor to improving business energy performance, and New Zealand's energy performance will continue to slide relative to other nations.

EMANZ supports a continuation of the residential insulation programme for low income households for the simple fact that New Zealand has invested in amassing a sizeable and competent set of businesses and individuals to address the long standing problem of poorly insulated housing, and that investment should be capitalised upon.

EMANZ believes at a minimum EECA's home insulation funding should be retained at 2015/16 funding levels through to the end of 2018 to give the sector the confidence to continue to invest in delivering great outcomes in this area, that importantly has some energy affordability and health co-benefits. A Home Warrant of Fitness should also be considered for these reasons.

EMANZ welcomes the acknowledgement that a finite global CO2 budget is essential, and that New Zealand should do its fair share. Leading by example and committing to a finite CO2 budget for NZ should form part of the policy response.

As a developed nation with high per capita emissions NZ should set a target at least as ambitious as other developed nations. As a remote nation relying on the purity of its natural environment for a competitive advantage in world markets, NZ should be highly sensitive to the perceptions of its trading partners and should be pursuing a strong climate change mitigation programme to protect and maintain this advantage.

New Zealand has a global advantage in clean energy production and strong capability in improving energy productivity. We should not be afraid of setting high performance standards for ourselves with respect to energy productivity, as we have a track record of being innovative and solution focussed. We have the capability and capacity to deliver, we just need some Government leadership to ignite the change.

Thank you for the opportunity to comment. The contact for this submission is EMANZ Executive Officer, Ewan Gebbie ([ewan.gebbie@emanz.org.nz](mailto:ewan.gebbie@emanz.org.nz)).