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BACKGROUND:

In 1991 New Zealand's delegation was instrumental in ensuring the Rio convention always referred to net rather than gross emissions. This recognised the very significant CO2 take up of forestry, farm and crop land that was a disproportionate share of New Zealand's productive outputs vs industrialised countries - was considered in any future emission calculations.

BASIS OF MEASUREMENT:

Despite this earlier commitment - New Zealand subsequently and very unwisely chose gross agricultural emissions as the basis of emission measurement rather than the scientifically accurate net emissions.

On a net basis – as calculated for biofuels – New Zealand's agricultural emissions are roughly half the published figures. From this perspective, New Zealand's overall emission levels show a very different scenario.

Biofuel emissions are calculated on a net basis as is forestry. If this was not the case, then biofuels could not be seen to be generating zero net emissions. Biofuels are deemed to be zero net emitters world wide as evidenced by the extensive programs underway to use them as solutions via numerous new fuel programs.

The simple and undisputed scientific fact is that the massive and certain absorption of atmospheric CO2 from New Zealand's extensive grasslands and crops is currently not counted against our published agricultural emissions figures as seen in the briefing paper. This leads one to believe we are a high emitter relative to others.

This is simply not the case.

Imagine a maize crop that is processed through a biodigester to make alcohol that is burnt as a fuel leaving universally acknowledged near zero net emissions.

Yet that exact same crop as grown on New Zealand dairy farms today - if processed by a ruminant digester - alias cow – to produce whole milk powder is denied the CO2 absorption credit in the crop that is allowed for in the biofuel case.

Any initiatives that are based on these scientifically incorrect assumptions will invariably deliver distorted outcomes – and that is exactly the situation we are now attempting to address.

PER CAPITA EMISSIONS:

Per Capita emissions makes no sense in any rational evaluation of the global emission issue. Imagine the closure of NZ's Aluminium smelter – a very real prospect in the next two months.

This would substantially reduce NZ's per capita emissions – yet the supply balance would be immediately taken up by increased output from low cost coal fired smelters thus delivering a very significant increase in global emissions – the exact outcome we are trying to prevent.

Similarly - per capita emissions from Iceland that has almost 100% renewable electricity and substantial smelter outputs will be high - driven simply by the low population levels. It would make no more sense to target per capita emissions in Iceland as it does in New Zealand. Any smelter reduction would simply result in increased global emissions. These issues are not unique to New Zealand.

ABSOLUTE EMISSION LEVELS:

New Zealand is a world leader in efficient low energy input, grassland farming methods. If we wish to assist in decreasing *global emissions* for any given level of food demand, then *increasing* New Zealand's farming outputs at the expense of less efficient producers would provide a net *decrease* in global emissions.

Higher New Zealand farm emissions will therefore perversely signal lower global emissions, the exact outcome we are seeking.

It therefore makes no sense whatsoever for New Zealand to offer any absolute reductions in emissions as this is very likely to constrain the ability to reduce *global* emissions.

Solutions to this issue will be found - as they always have been - by research, development and advances in technologies allied with price signals that incentivise behaviours targeting the outcomes we seek.

High levels of economic growth will make any reduction targets offered non-achievable.

New Zealand is experiencing some of the highest growth figures in the OECD, and while the takeup of new technologies such as LED light bulbs and the slow penetration of hybrid vehicles will constrain consumption growth, the impact of very high and unprecedented levels of net migration and GDP growth will eventually translate to inevitable energy demand growth including transport fuels.

Vehicle imports for example are running at all time highs of over 300,000 pa and net of replacements taken off the road and increased efficiencies – these very high increases in on road vehicles will eventually lead to increased transport emissions.

This will be the situation both in New Zealand and other countries. With already some of the highest share of renewables in power generation anywhere driven by our existing hydro, geothermal, solar and wind generation capacity - we simply do not have the ability to make absolute reductions in this segment. We will always need to maintain thermal capacity to back up non dispatchable wind and future solar generation. We are already near the level where the share of thermal generation can not be lowered and grid security maintained over the inevitable future dry years, generation failures and grid interruptions.

We have no very high emitting base load coal plants to switch to gas or close down.

China, the worlds largest emitter has announced growth targets of ~ 7% for the next decade. This means the economy will be roughly twice it's current size in 10 years if this target is achieved.

New technologies, a switch away from coal to natural gas and decreased energy intensities from a more service focused economy will not create commensurate emission increases. There is no conceivable scenario where absolute reductions can be achieved even with substantially lower growth.

While switching from coal to gas for power generation offers significant emissions reductions – often overlooked is that roughly half the coal mined is used in the production of steel and cement for which there is no substitute.

Despite all the rhetoric – China will not be offering absolute emission reductions at the upcoming conference in the short to medium term. Neither should we.

To put this in context - they are now producing ~ 24 million vehicles per annum, have just signed a huge new gas deal with Russia and have some 5000 new commercial

aircraft orders planned for the next 15 years. Airbus expects Asia Pacific – predominantly China - to order over 8500 new aircraft over the next 20 years.

China added 3 x 1000 mW coal fired power units every four weeks in 2014. Oil imports reached new all time highs.

It is simply not possible to add this level of incremental emissions and then offer any absolute reductions in emissions. They have refused to pay EU wide aircraft emission charges, now postponed temporarily, and will not be changing their stance in future.

China will achieve emissions reductions over time as a large and expanding number of new nuclear plants come on stream coupled with new technologies but this will take many years and be outside any commitment period under discussion.

Similarly there will be other major emitters that are simply going to make commitments they have no possible way of meeting.

Germany is a major industrial producer experiencing strong growth with a commitment to close it's zero emission nuclear plants. Despite the increase in solar and wind generation – none of this is dispatchable so to provide reliable 24/7 power it is re-opening brown coal plants – the worst possible approach to reduced emissions.

Any German commitments to reduced emissions will be a farce and we need to understand this to be the case.

Closer to home - Australia's Loy Yang 3,150 mW brown coal power station and adjacent mine producing some 30 million tons per annum - one of the largest in the world - would have emissions grossly disproportionate to New Zealand's total emissions from all sources. Mine resources are sufficient to last another 1300 years and two new aluminium smelter offtake contracts have been signed through to 2036.

Simply converting this station to gas, which is not going to happen, would offer massive and immediate emission reductions making any commitment we might make to very expensive marginal reductions from an existing low base level as totally irrelevant and futile.

It is simply farcical that we should be even contemplating encumbering our economy in any way with reduced emission commitments when all around us - emissions on a huge scale of many magnitudes greater are continuing and expanding into the foreseeable future.

New Zealand is already a very low emission nation with a small population, very high levels of renewables, some of the worlds most efficient farmlands and low levels of industry. We need to use this simple fact as a base line at the upcoming conference.

TECHNOLOGY SOLUTIONS:

What we should be offering is a continued commitment to grassland and crops research focused on more efficient CO2 capture. Today our research is focused on ruminant emission reductions – primarily methane - when increased absorptions from our grass and crop lands may offer a far more cost effective route to reduce higher levels of net emissions and at the same time increase farm productivity.

Higher growth rates have been achieved in forestry over the years from ongoing research. This approach can also work with our grasslands and crops if the potential benefits are going to be recognised.

Because we have foolishly chosen to ignore farmland net emissions, we have no incentive to research what could well be the most effective research route to emission reductions via increased grass and crop land productivity with it's associated economic benefits.

New Zealand needs instead to show we have appropriate incentives that will over time further reduce our emissions per unit of output and in the case of transport reduce our current account deficit by more efficient vehicles lowering our oil import consumption bill.

Australia has annual registration fees based roughly on engine capacity by using the number of cylinders.

It would be very easy for NZ to introduce similar pricing regimes based on engine capacity and vehicle empty weight which together very much mirror fuel efficiency.

Diesel engines will always be more efficient than gasoline powered vehicles. Road taxes should reflect this fact to provide economic incentives to favour diesel over gasoline.

Maintaining floating excise duties on gasoline – which excludes almost all commercial vehicles which are now already diesel, so that gasoline prices, net of oil prices and exchange rates deliver constant real prices for liquid fuels at the retail level would allow consumers to plan vehicle purchases on stable and predictable fuel costs.

Encouraging liquified natural gas (LNG) for heavy transport, in particular trucks returning to a common depot such as Fonterra's large fleet of heavy trucks, would deliver very significant emission reductions, lower fuel costs and have positive balance of payment benefits. LNG is very much the fuel of choice today for a very signifcant share of North American heavy truck fleets. Multiple engine providers offer a full range of LNG engines for these markets.

Implementing congestion pricing regimes to improve vehicle efficiencies through higher average speeds and less stop start driving, providing incentives to car share and through optimising road capacity thus reducing or delaying new road capacity investments will all contribute to lower transport emissions.

Constraining vehicle import volumes through an auction system that recognises road capacity constraints as used in Singapore for many years to effectively increase the price of cars, lower emissions from lower car numbers and reduce congestion on the roads leading again to higher average speeds and reduced emissions from slow and stop / start driving will have both emission and economic benefits.

TECHNOLOGY EXAMPLE:

A very recent program on National Radio interviewed Mr Wright - a Californian based New Zealander and co-founder of Tesla Motors who illustrated how by targeting specific market segments such as stop / start rubbish trucks with currently available hybrid technology - dramatic reductions can be made in high emission target markets and offer relatively short payback periods.

A small car may consume some 500 litres /annum, a medium scale rubbish truck on domestic collection duties some 60,000. One company alone in NZ has some 850 rubbish collection trucks.

It makes far more sense to provide the appropriate investment incentives to save 30,000 litres per annum per truck than current incentives such as zero road pricing fees currently offered till 2020 for electric cars with minimal effect.

These types of initiatives have the added benefit of reduced oil imports. The reduced oil imports benefits our parlous and long running current account deficits which continue to be a huge risk to New Zealand's economy as highlighted by all three rating agencies. Recent trade balances show a continuing sharp deterioration which we will have to address eventually.

Current initiatives which appear superficially attractive but involve significant capital imports such as electric cars and solar domestic roofing programs that could result in simply spilling water over existing hydro schemes - make no sense whatsoever and will do virtually nothing to reduce national emission levels.

Australia recently reported that their domestic solar program has incurred unnecessary costs of A\$ 14 billion and reduced emissions at a cost five times higher than recent auction prices.

While we are running base load thermal plant 24/7 as the marginal generator, as we do today – the marginal incremental consumption of electric cars simply increases thermal emissions with virtually no efficiency gain over a modern hybrid.

This is another example where what is seen at first glance as an obvious benefit to emission reductions is simply not the case.

CONCLUSIONS:

New Zealand must first recognise the correct scientific calculation of our actual net emissions.

New Zealand should not make any international commitments to either reduced per capita emissions, nor any reduced absolute levels of emissions over any time frame for the simple reason that these targets while superficially attractive will have perverse second order effects of constraining initiatives to reduce global emissions.

Specific technology initiatives driven by appropriate market signals from pricing initiatives and specific Government programs targeting specific high emission market segments with currently available technologies will deliver economic benefits to both targeted users and consequent emission reductions at a national level for any given level of economic activity without detracting from economic growth within New Zealand.

High national growth scenarios will increase emissions from virtually all sectors over time given the very low base from which New Zealand starts today.

We cannot ignore balance of payments constraints when so much of our exports comes from agriculture.

The continued high growth, high net migration, unfettered vehicle imports, low fuel prices, and lack of dynamic road pricing from current policy settings will make any any commitment to absolute reductions unattainable.

In a world projected to have some 3 billion more people by the 2050's – it simply not tenable to even contemplate constraining production of one of the worlds most efficient food producers with the perverse effect of increased global emissions.