Wellington, 13 August 2019

Ministry for Environment
WELLINGTON

Re: Action on Agricultural Emissions

We congratulate the New Zealand Government for taking an important step towards a zero-carbon future for New Zealand, as part of its agreed obligations towards the global reduction of emissions under the Paris Accord.

I. Executive Summary

We have reviewed, assessed and reflected on the documentation provided by the Ministry for Environment, including the Action on Agricultural Emissions Discussion Document and the supporting report and annexes from the Interim Climate Change Commission (ICCC). Due to the 350 or so pages of technical and economical information it has been a fair challenge to work through the detail and reflect on the intent and purpose, as well as expected outcomes, from the proposed agricultural emissions framework and targets.

Due to time constraints we have therefore limited ourselves to a list of key findings, which touch upon but do not directly answer the response framework questions proposed by the Ministry for Environment on the Submission website. We have eliminated any observations and recommendations with which we were not comfortable at the time of submission, to avoid creating the wrong impression.

Equally, we apologize for any misunderstandings or wrong assumptions we have worked from to prepare our recommendations, which could be inherent in the necessity to review a large volume of documentation, in a short period of time. We therefore look forward to the planned re-engagement on the number of topics and recommendations noted in the Discussion Document.

As background, our comments and review are informed by our deep involvement in finding, deploying and financing green technologies and solutions in critical industrial sectors.

Based on our experience and work with a wide range of potential solutions to achieve reduced emissions, the key barrier to technology deployment are a lack of clarity and medium to long term goal setting in policies and regulations, including carbon pricing. In a world where net profit is still the key metric of success, only taxes or penalties will push for a faster rate of adoption of existing and developing low carbon technology, and only if the policies and regulations are credible and expected to be consistent over a longer period ahead.

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The key themes of our proposed adjustments and recommendations are therefore as follows, at this stage:

1. Greater transparency, not just for farmers and the agricultural sector, but for all New Zealand and international stakeholders.

2. Further independent verification of carbon impacts at the entity level, target setting and supporting calculations, both from a finance administration and independent attestation perspective.

3. Legislative enforceability of targets and interim milestones to 2050.

4. Faster and steeper emission taxes, at much lower free emission rates.

The following proposed adjustments to the Agricultural Emissions framework are aligned with, and support, the conclusions we have noted.

We have included a Background to our submission in Appendix I, to highlight the independent context from which we have performed our review and prepared our proposed adjustments.

II. Proposed adjustments to Agricultural actions proposed by Ministry for Environment.

1. **Free emissions should not be set at 95%**, and a much clearer pathway to reduction over time should be enshrined in law. The current proposal provides little incentive to change in the medium term to 2025. As we have practically noted internationally and in New Zealand, carbon taxes under the NZ ETS are not currently incentivizing emitters included in the NZ ETS framework, to adopt technology solutions faster. The NZ ETS framework operates under equivalent high levels of free credit allocations as proposed under the Agricultural Emissions framework. Both frameworks also lack any clear pathway and incremental milestones over future decades towards major reporting dates in 2030 and 2050.

2. **Agricultural emissions pricing should be explicitly tied to the NZ ETS carbon credit pricing.** It is not clear whether the Agricultural Emissions proposed are explicitly tied to the NZ ETS pricing of New Zealand Units (NZU). In addition, current NZ unit pricing is not set sufficiently high to meet New Zealand Paris Accord targets, and do not incentivize market players to change. The (NZU) is set at NZS 25. With the effect of free allocations, there is no incentive to adopt solutions including technology solutions, under the current economic paradigm. For example, the current calculation provided in Table 1 of the Action on Agricultural Emissions Discussion Document show that a $ 0.01 emission cost would be levied per unit of production for milk, at a market price of $ 5.73. This is equivalent to a tax obligation from 2021 until 2025 of just 0.02% per kg of milk fat, which is negligible. An alternative proposed is to use international guidance on what carbon credit pricing should look like to create meaningful change and reduce emissions. For example, the IMF ( IMF Fiscal Policies for Paris Climate Strategies – From Principle to Practice, May 2019) notes in its report

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that emission pricing needs to be at least around US$ 50 per tonne of emissions to achieve 2030 targets, which is equivalent to NZ$ 77 per tonne of CO2-eq emissions. An appropriate charge on agriculture would therefore be in the region of $ 0.03 for the aforementioned milk products category at an equivalent 0.02% tax rate. Our question is whether this will have any meaningful impact at all at that level.

3. **Current emission pricing will have a negligible impact on emissions.** On page 20 of the Discussion Document, it is suggested that the proposed emission pricing for agriculture would reduce emissions by 120,000 Tonnes CO2 – eq. per annum or 0.3% of total agricultural emissions. To put this in context, the proposed estimated reduction would be a 0.14% reduction in total emissions for New Zealand annually. Since NZ emissions are increasing year on year, and most recently by 2.2%, the resulting reduction proposed is negligible and could well be interpreted as ridiculous by national and international stakeholders, including the New Zealand public, which produces an extremely high and growing per capita emissions quantum annually already.

4. **Cost of New Zealand taxpayer contributions should be transparent, clearly communicated, debated and agreed.** Whereas the actual costs to the agricultural sector are defined in the Discussion Document, as per the tables on pages 22 of the document, there is not anywhere a reference to what New Zealanders are signing up to as a country population. By our calculations (subject to the completeness and accuracy of calculation, as well as models used to support the projections), free allocations of emission credits at a 95% level suggest that New Zealanders are effectively supporting agriculture with taxpayer funds of around NZ$ 1 billion per annum from 2021 until 2025. This is equivalent to a New Zealand taxpayer hand out of NZ$ 4 billion based on 38.79 million NZU @ $ 25 per unit. If a fair value was established for the NZU at a level in line with IMF proposals, and at a rate to have meaningful impact and reach 2030 targets, the value of this collective New Zealand taxpayer subsidy to the agricultural sector is equivalent to around $ 3 billion per annum. To put this in context, our current annual exports from agriculture are around $ 22 billion. The achievement of these agricultural export revenues, which accrue to the 20,000 – 30,000 owners and operators of New Zealand farms, are therefore potentially subsidized by New Zealanders at a rate of indirect tax of around 4.5 % - 13.6%.

5. **Reflect the impact of New Zealand subsidies on overseas investors.** The Discussion Document points out there around 20 – 30,000 farmers in New Zealand currently. Proposed NZ government and taxpayer support for each of these farms equates to between $ 33,000 and 100,000 per farmer. Statistics for overseas ownership and sales to overseas interests are apparently poorly recorded. By some estimates, the total land holding by overseas investors may be well over 10%. This does not factor in the number of individual farms owned by overseas investors. On the assumption that overseas investments make up a low end of 10% of total number of farms, New Zealanders are therefore also collectively proposed to subsidize overseas investments to the same amount per farm, and are likely to subsidize foreign investors to the amount of up to $ 300 million per annum for the period 2021 - 2025.

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6. **Completeness of calculations.** At this stage the Discussion Document appears to note the emission pricing is calculated at farm level, and we assume this to mean at farm gate. If this interpretation is correct, then the Life Cycle Assessment on each of the agricultural produce areas noted in Table 1 of the Discussion Document omits to factor in emissions before the farm and thereafter from farm gate to consumer. This suggests that total emissions are understated. For example, by limiting the Life Cycle Assessment to the farm gate no impact from processing, transportation, logistics and packaging are factored into the total emissions. As a simple example, calculating emissions per kilo of milk solids without factoring in the processing, including coal fired drying, omits major emitting processes. Further, in doing so, the real cost of externalities is not reflected in market pricing to end consumers for example, in China, while leaving the burden of those externalities with New Zealand and its stakeholders.

7. **Factoring in all externalities and impacts.** The proposed emissions taxing does not currently factor in other externalities. As per our Background description in Appendix 1, we have been witness to ground water pollution, soil degradation and the negative consequences both in the Netherlands and in New Zealand. Examples are plentiful and visible in our media. It is in our opinion reasonable to propose all other externalities be factored into a taxation framework to recognize the real cost of delivering green and clean steaks to Chinese end consumers, and investment returns to overseas investors, at a fair market price that reflects the costs to New Zealanders now and in future. The risk in not doing so is that a singular focus on CO2-eq emissions will result in unintended consequences in other externality categories.

8. **Independence of calculations.** There also does not, from our review, to appear a significant or any involvement from the NZ Treasury, which is usually the government body involved in calculations related to what essentially boil down to taxation matters. Equally, we have noted the complexities of documentation, underlying models, and external advisory reports from private and public sector and believe there is a good case to be made for an independent review of, and report from, the Office of the Auditor General, considering the major impact the agricultural emissions pricing will have both immediately and into the future.

9. **Advancing the overall target date for zero emission from 2050 to 2035, setting firm interim milestones.** A number of progressively tighter targets are legally enshrined globally, or in the pipeline. This is influenced by our growing realization that change is not happening fast enough and that we face an existential threat. Scientific research is progressing and creating greater insights into complex interactions between Mother Earth and the atmosphere, including the manner in which the ice melting is accelerating in the Antarctica, and the potential implications of a complete perma-frost thaw in the Arctic. In our Background description in Appendix 1, we have noted the potential lag time in ice melting compared to the historic high level of atmospheric CO2 at 415 ppm. The current Discussion Document does not project out beyond 2025, and notes that “The method of free allocation at the farm level will be the subject of further work, consultation and subsequent legislative changes after 2022.”. 2025 is close to 2030, when New Zealand and the world is supposed to be well on track towards the agreed

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targets under the Paris Accord. In terms of investment horizons for farming, the short time frame and horizon under the current proposal create substantial uncertainty for agricultural sector actors and those intended to participate through investment and operations. We propose clear milestones are already defined between now and 2050, and much sooner than 2025, to support the achievement of reduced agricultural emissions. This is especially relevant, since total emission reduction targets are already known, and as we have proposed, should be legally enforceable. Working backwards from 2050 it should not be any challenge to define the milestone thresholds, including the reduction of the free allocations and the actual target emission reductions.

10. **Integration with other NZ initiatives and any of those initiated overseas with impact on New Zealand.** Although forestry is referred to in the Discussion Document, the actual interaction and financial consequences of the one billion trees programme, for example, is not referred to. In the total comparisons of impacts on agriculture of the emission taxes, the administration and costs of administering certification and audits, for example, there is no reference to the actual costs and externalities of tree planting as an alternative. We believe a full assessment of all options related to agriculture should be included, including relative costs and benefits, of those solutions that currently exist and are in some cases already priced, as is the case with afforestation options.

11. **Making the targets enforceable.** Internationally, legislation is enforceable. There is no reason why New Zealand should not define the enforceability of its environmental targets in legislation. This is especially because our government tenures are a short three years and are unlikely to be revised. Even if the governance period were to be increased, this would not be effective considering the medium to longer term requirements to reduce GHG emissions consistently by 2030, 2035 or 2050.

12. **A target per capita emission in stages.** Due to our critically high per capita emissions profile in New Zealand it is recommended that a yearly statistic be published and communicated to the New Zealand public on their individual per capita emissions, both in New Zealand’s context as well as in a global ranking, similar to the Transparency International CPI ranking. This should be broken down by sector equivalents including agriculture, so that all New Zealand stakeholders clearly understand the actual costs of producing and exporting our clean and green produce to consumers overseas, which is currently conducted with the unacknowledged subsidies from each New Zealander.

We wish the Committee members much courage in tackling this major piece of work that should set the tone for the benefit of current and future generations of New Zealanders.

Ferdinand C Balfoort (MCA,CA,CIA)

Managing Director

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Appendix I - Background

By way of introduction and for background, leading up to our recommendations, the following submission is made by Balfour and Associates as a company. Balfour and Associates was established in 2011 in New Zealand. It has offices in London and Wellington. Our company is an Impact Advisory Boutique that supports and advises green and clean technologies from start-up phase through to deployment and scale up globally. Our aim is to achieve meaningful reductions in carbon emissions and other wastes in several key industry sectors, including agriculture, heavy industrial and maritime, through the introduction and deployment of much needed green technology solutions. A part of our advisory services also includes capital raising for these green technologies. We are therefore very much at the coal face, for want of a better word, and we know the challenges faced by NZ businesses and globally.

I (Ferdinand C Balfoort) am the Managing Director and one of the founders of the company, together with Michael v B Nagel in London. I have formerly been an auditor and investigator globally, for a quarter century, working in more than 40 countries. Many of these countries in Asia, Africa and elsewhere were then already subject to anthropogenic climate change impacts. They are increasingly exposed, and apparently more so than temperate geographies. During my time as a professional auditor I have investigated and reported on fraud, corruption, environmental issues, corporate governance, as well as financial reporting and attestation of company accounts. I provided services both to large listed multinationals, private companies, and institutions, of which many are operating in the oil and gas sector. I have seen the temperatures rise globally over the past 30 years of travels, and it is clear these temperature rises are not a one-off aberration as some would have it.

Michael v B Nagel is a highly experienced investment banker with a broad range of global experience from Wall Street and the City of London. His understanding and sense of the challenges in capital raising for green technologies globally provides a very complementary perspective to this submission.

I arrived in New Zealand with my parents in 1981 from the Netherlands. My father was appointed to manage the construction and operation of the Wellington Sewerage Treatment Plant at Moa Point. Until 1981, Wellington’s sewerage was pumped into Cook Strait. When we arrived at Wellington airport, the toilet paper was hanging of the rocks near Lyall Bay, swarms of seagulls that apparently used to be a bit of a menace to the airplanes. The reason for their presence was fairly clear, although the waters were not.

The 1981 family effort to find a clean green future in New Zealand was after my parents decided they didn’t much appreciate the on-going pollution of Dutch waterways and soil by industry and agricultural sectors, among other environmental issues they observed. I well recall the many call outs with my father, as regional supervisor of a sewerage treatment plant, to collect dead fish from waterways, due to fertilizer run off and ultimately botulism. I also recall the many discussions we had around family dinners on the growing manure mountain in the Netherlands. This resulted in over-fertilizing by farmers causing soil copper content to rise astronomically. I witnessed this process first-hand, living in the middle of a major agricultural area in the Netherlands.

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These underlying reasons from the 1970’s are somewhat analogous to the current New Zealand experience of the increasing nitrate levels in rivers caused by effluent run-off from livestock, the current estimate of the quality of our waterways, and suggestions that high nitrate levels in drinking waters in Canterbury could be linked to colon cancer.

My father and mother were early adopters of the Club of Rome report recommendations in 1972. The original Club of Rome report warnings and projections from 1972 are on track, unfortunately for humanity. I therefore grew up in a scientific and environmentally- oriented and attuned family. Since the age of 7 years I lived on the grounds of major regional water treatment plants. I gained an early and intimate understanding of water and its impact on the environment. We emigrated to New Zealand because it was at that time very clean and green. It offered a better future for us, in my parent’s considered opinion.

Since the almost 40 years I arrived in New Zealand, clean green New Zealand emits one of the highest levels per capita of GHG gases, including CO2 and Methane. Our surface waters have deteriorated. It appears 66% of NZ surface waters my father came to assist in keeping clean are now at risk, if we can believe our monitoring systems, about which there is substantial doubt. We emit around 16.875 tonnes of GHG gases per capita, well above some well-known big polluters globally. Closest to us, but in some cases still some way behind, are UAE, Australia and even the United States. We may have a relatively small population, but we punch above our weight in this critical area. I don’t think it is something we should be happy about. It is discordant with all the other major achievements of which New Zealand should be justifiably proud, including women’s suffrage, a highly positive ranking on the Transparency International Corruption Perceptions Index and our strong sense of society. High transparency levels in our governance and above average murky emissions make strange bedfellows. One could argue that it doesn’t matter. Even at our above average levels of emissions per capita, we account for a small percentage of global emissions of around 42 Gt of CO2.

My father forecast and advised the Wellington City Council against their budget driven cuts to the treatment plant technology to be deployed. The cheaper solution was to pump sewerage sludge to the Southern Land Fill. His warnings about the likely impact on the environment are now coming true, one generation later. The Wellington City Council is belatedly budgeting NZ$ 34 million to finally treat the untreated. This is an example that we have a historical habit of making short term focussed expedient decisions, resulting in passing the problems to a next generation, even though we know better.

We are in a Race of our Lives, as Jeremy Grantham, a major benefactor of environmental projects globally, put it recently. Or as our New Zealand Prime Minister stated it, this is our Nuclear Moment. We don’t have much time therefore, certainly not 40 years. We can’t continue to pass our problems down the track to a next generation. Since these immortal words were apparently first uttered in the late 18th century, “Après nous la deluge” is likely to take on a literal meaning to our children, and in many cases to ourselves.

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Signs are quite evident that climate change impact is already accelerating at pace. This includes some parts of New Zealand where our population is either moving to higher ground, or is having to plan urgently for such a move to avoid being washed away. We see the same in the Pacific Islands, which are not far from us, in our own “backyard” so to say. A projected upper increase of 2.5 metres in sea levels will kickstart major population shifts of the 6 million or so inhabitants of the Pacific Islands.

Apart from some climate deniers, it is now fairly much accepted that climate change is caused by human activities (anthropogenic), specifically our emission of CO2 and GHG emissions since the start of the Industrial Age. A recent IMF report, one of the many we read regularly to keep up with developments globally, noted that “Meeting the Paris goals of containing projected warming to 2°C—with an aspirational target of 1.5°C—would imply immediate and dramatic reductions in carbon dioxide (CO2) and other greenhouse gas (GHG) emissions………. Without action, in central case scenarios global average temperatures are projected to rise 4°C above pre-industrial levels over the 21st century (they are already 1°C above), with increasing (but poorly understood) risks of globally catastrophic scenarios such as runaway warming (e.g., from sub-surface methane releases), collapsing ice sheets, and flipping ocean circulatory systems. 17 of the 18 warmest years on record have occurred since 2000.” Rather? Not? coincidentally, in the last 18 years New Zealand’s national emissions have only been going up.

The IMF report is public evidence of an increasing acceptance that global warming will not be contained at 2°C this century. It is also one of the first institutional reports we have read that refers to an existential threat to humanity. This is because the levels of carbon in the air have exponentially increased from their levels in the late 1960’s. They are currently at a level of 415 ppm, increasing faster each year than projected, and last seen when sea-levels were 25 metres higher globally. The reason our sea-levels are not at that level yet is most likely due to a lag effect as ice melting has simply not caught up to the new dynamics. This means that a 25 M sea rise is not predicated on temperature increases solely.

The Earth is in fact already playing catch up, and it is just a matter of time. Scientists are currently unable to define the timeline accurately due to known unknowns in the environment. As scientific research progresses, unknown unknowns will emerge.

From our work globally with green technologies we know there have been no major breakthroughs in the deployment of carbon reducing technologies, apart from renewable energy, for which investment is slowing down globally based on latest reports. However, we need immediate and dramatic reductions now, not later, as the IMF suggests. A recent documentary called Fire on Ice directed by Leonardo DiCaprio makes much the same point, which is consistent with our findings on the ground.

This need for speed appears to be recognized by a number of other countries globally which have decided to advance the net zero-carbon goal in law or proposed law. These include the Scandinavian countries that New Zealand is usually compared to favourably, including Finland (2035), Norway (2030), Iceland (2040) and Sweden (2045).

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Based on our work with a wide range of potential solutions to achieve reduced emissions, the key barrier to technology deployment are a lack of clarity in policies and regulations, including carbon pricing. In a world where net profit is still the key metric of success, only taxes or penalties will push for a faster rate of adoption of existing and developing low carbon technology, and only if the policies and regulations are credible and expected to be consistent over a longer period ahead.

There has been much discussion in the media about the lack of technologies available to address wide-ranging issues such as industrial GHG emissions, agricultural methane. On the contrary, we know of many initiatives, projects and advanced solutions in the pipeline that can address emission challenges across New Zealand. Some of the technologies are over 100 years old. They were available even before the first international newspaper report on coal emissions and global warming was printed in New Zealand in 1912. We have known the problem and we have also known the solutions for a century or more.

An example is bio refining technology to accelerate the production of micro algae that may have a potential to reduce ruminant methanation. The current deployment of proven technology to take carbon from industrial emissions to convert to algae is miniscule. Research into which micro algae could be more effective to mitigate methane from livestock is in its infancy. The development of inhibitors and vaccines is progressing but also has no meaningful horizon for deployment until around 2025. Funding and investment decisions are slow, delayed and subject to the same economic considerations as we have had historically, i.e. without material consideration for the externalities mitigated and environmental benefits achievable faster through more prompt deployment and greater focus. Vested interests are well documented, as they are in other industrial branches, which prevent us moving into a new and more environmentally attuned paradigm.

In absence of green technology solutions being deployed in any meaningful manner, coupled with latest news reports on Arctic perma-frost melting and the lack of credible progress on carbon reductions generally, we suspect a temperature increase of 2 - 4 C is likely this century therefore. We note this with regret. This also points out the fact that scientific research and conclusions are rapidly advancing and providing more accurate insights into developments that were not previously as well understood nor factored into earlier target setting exercises.

We believe sea level rises are therefore projected too conservatively so far. Based on some estimates and projections, our major New Zealand population centres will be badly affected. By some calculations, if we stay within the lower limit of 10 Metre sea-level rises, it appears up to around 600,000 New Zealanders will be on the move this century.

We believe it is equally valid to extrapolate the above scenario to the rest of the world, for example Bangladesh. Asia and Africa and countries around the Equator will be more affected by climate change and could be a powder keg due to location, levels above sea and population densities. Bangladesh has the world’s 10th highest population density, a 163 million population and 25% of its landmass not more than 7 feet above sea level. This is already well in reach of previous forecast sea-level rises. On a straight-line extrapolation, discounting

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variations of population densities in Bangladesh, around 40 million inhabitants of that country will be on the move this century.

Such a major population movement will cause a domino effect, more than likely. This is already happening now and has been in recent past. The Syrian conflict and major population displacements are conjectured to have been caused by a period of years of drought, and a subsequent movement of the Syrian population to its urban centres. The African and Syrian population replacements resulting from climate change are equally thought to have driven the Brexit referendum outcome and the subsequent economic impacts in the UK. Recent newspaper articles from India suggest the increasing temperatures are already having significant impact on productivity, health and migration locally. Droughts in Central America are posited to be causing the increasing flow of aspiring immigrants to the USA, and the resulting building of the infamous wall.

On a historic note, our ancestors who settled in York in the 10th century, experienced this negative impact first-hand. Human and animal waste reportedly increased dramatically with the growth of York’s urban population until 930 CE. Notable is that life expectancy and actual size of humans dropped dramatically thereafter, based on archaeological records after this date. This negative impact on health and quality of life coincides with a less diverse diet, and the extermination of biodiversity in local waterways, including high protein shellfish populations. None of this is therefore news.

In conclusion, what we need most now in New Zealand are clear signals to the economy and globally that we understand, accept and are serious in discharging our responsibilities to target and achieve meaningful emission reductions. Our national targets should be consistent and enforceable. They should not be affected by political pressure or for other expedient reasons. The aim should be to send a clear signal both to Kiwis as well as to the wider world that New Zealand is serious about our obligations to humanity and to our commitments under international agreements. We should be able to evidence our commitment to a clean and green New Zealand.

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