



NEW ZEALAND

Submission to the Ad Hoc Working Group on the Durban Platform for Enhanced Action

Work Stream 2

Opportunities for actions with high mitigation potential, including those with adaptation and sustainable development co-benefits, as referred to in decision 1/CP.19 “Further advancing the Durban Platform”, paragraph 5(a)

June 2014

Context

1. This submission responds to the invitation contained in document FCCC/ADP/2013/3, paragraph 29, requesting Parties to submit their views on opportunities for actions with high mitigation potential, including those with adaptation and sustainable development co-benefits, as referred to in decision 1/CP.19 “Further advancing the Durban Platform”, paragraph 5(a), including their mitigation benefits, costs, co-benefits and barriers to their implementation and strategies to overcome those barriers, including finance, technology and capacity-building support for mitigation action in developing country Parties.

2. This submission builds on, and should be read alongside, New Zealand’s previous submissions to the ADP Work Stream 2 (March 2012, March 2013 and September 2013). New Zealand would like to thank the Alliance of Small Island States (AOSIS) for proposing a template to assist in communication of actions with high mitigation potential. We have applied this template to some examples of action by New Zealand in the annexes attached to this submission. New Zealand would also like to acknowledge the input to the submission provided by a number of private sector entities.

Increasing mitigation ambition through ADP Work Stream 2 (WS2)

3. New Zealand welcomes the opportunity to make a submission on pre-2020 mitigation ambition, and would like to highlight the following points:

- WS2 Technical Expert Meetings (TEMs) provide a good forum for advancing options for increasing pre-2020 mitigation ambition by allowing examination and understanding of actions with significant mitigation potential and means to overcome barriers to their uptake. New Zealand looks forward to contributing to the ADP technical meetings on land use and urban environment to be held at the June SB40 sessions.
- We suggest a useful output of the June WS2 meetings could be a written summary of the high mitigation potential actions identified so far by the ADP, to be prepared by the Secretariat. This summary could then be presented at the 2014 UNSG Leaders’ Summit, as a means to influence action by Parties.

- In our view WS2 should continue to facilitate input by experts throughout 2014, including from non-governmental organisations, inter-governmental organisations and the private sector.
- We propose that possible themes for future meetings could include: fossil fuel subsidy reform; energy efficiency; clean and renewable energy; short-lived greenhouse gases; electric vehicles; and international cooperative initiatives.

New Zealand's mitigation actions

4. Climate change is a global issue and New Zealand is committed to contributing to an ambitious global response. New Zealand works actively to support the development of a new and comprehensive global agreement and has a broad range of measures in place to mitigate greenhouse gas emissions, on both a domestic and an international level. New Zealand focuses its efforts on actions where it can make the greatest impact.

5. New Zealand contributes to the WS2 goal of enhancing pre-2020 mitigation ambition by:

- implementing domestic policies and measures to reduce domestic emissions, particularly through the New Zealand Emissions Trading Scheme, as well as programmes on energy efficiency, renewable energy and agricultural research;
- researching and implementing measures to reduce agricultural emissions, both domestically and by using our expertise to assist other countries; and
- working through the New Zealand Aid programme to support our development partners to implement activities that reduce emissions through a focus on renewable energy and energy efficiency, particularly in the Pacific; and engaging constructively in multilateral initiatives and international fora in pursuit of a transition to a low carbon future.

6. New Zealand's national circumstances and unique emissions profile restrict available low-cost abatement options:

- Nearly half of the nation's greenhouse gas emissions come from agriculture and are predominantly determined by genetics and production volumes.
- Renewable energy is already well established, with the share of electricity generated using renewables ranking amongst the highest in the world.
- New Zealand's low population density makes economies of scale difficult to achieve.

This combination of circumstances means that opportunities available to many other nations to reduce emissions through conversion to renewables, mass public transit, and energy efficiency in industry have less potential to reduce emissions in New Zealand. New Zealand has sought to overcome this challenge by investing in actions to deliver long-term abatement opportunities.

7. Pre-2020 mitigation action is incentivised by New Zealand's national emission targets:

- We have set an unconditional target of a five per cent reduction in emissions below New Zealand's 1990 greenhouse gas emission levels by 2020, managed using the Kyoto Protocol's second commitment period framework of rules.

- A conditional target range of a 10 to 20 percent reduction below 1990 emissions by 2020 remains on the table, subject to fulfilment of those conditions.

A range of policies and initiatives, which align with the WS2 goal of enhancing mitigation ambition, have been designed to aid in delivering on these targets. These are discussed below.

New Zealand Emissions Trading Scheme

The New Zealand Emissions Trading Scheme (NZETS) is the principal policy tool underpinning domestic emissions reductions. The NZETS is a broad-based trading scheme that incentivises domestic abatement by placing a carbon price on emissions. The scheme covers the forestry sector, transport, stationary energy¹, industrial processes, synthetic gases and waste sectors. The agriculture sector is covered by reporting obligations. New Zealand recognises carbon pricing, by way of emission trading schemes and other means, as an important policy tool for incentivising emission reductions. We see considerable value in convening a Technical Expert Meeting focused on carbon pricing.

Agriculture

8. Because agriculture is a core part of the New Zealand economy and because agricultural emissions comprise almost half of New Zealand's GHG emissions, New Zealand has focussed on creating a knowledge base around agricultural GHG mitigation that could be valuable for other countries. Though agriculture has not yet entered the NZETS, much has been learned about how to effectively facilitate and create incentives for agricultural mitigation.

9. Domestically, New Zealand has a number of policies and measures aimed at helping farmers continue to achieve efficiency improvements. One example is the Primary Growth Partnership, which has mobilised \$708 million of public and private finance (each project is at least 50% privately funded) for projects that boost productivity, encourage innovation, and deliver long-term economic growth while enhancing sustainability including through further reductions in emissions intensity. The impact of these policies has been a reduction of total greenhouse gas emissions per unit of agricultural product (i.e. per kilogram of meat or milk solids) by around 20 per cent from 1990 levels.

10. New Zealand provides leadership in research, innovation and technical solutions to reduce greenhouse gas emissions from agriculture, and is committed to sharing this knowledge internationally to enhance global mitigation ambition, including by:

- helping to found the Global Research Alliance on Agricultural Greenhouse Gases (the Alliance). The Alliance aims to increase international cooperation, collaboration and investment in agricultural research that will help deliver ways to grow more food (and more climate resilient food systems) without growing greenhouse gas emissions. The New Zealand government has committed \$45 million to June 2019 to support the work of the Alliance. This funding supports collaborative research projects, scientist exchange schemes, technical workshops, capacity-building initiatives, development of guidelines on measurement and mitigation techniques, and the creation of international research networks. **(see Annex 1 for Alliance case study);**
- establishing the New Zealand Agricultural Greenhouse Gas Research Centre (NZAGRC), which focusses on practical ways to reduce methane and nitrous oxide

¹ The stationary energy sector includes all fossil fuels (gas and coal) used in electricity generation and in the direct production of industrial heat, as well as geothermal energy.

emissions and enhance soil carbon sinks on agricultural land while improving productivity (**see Annex 1 for NZAGRC case study**);

- leading the development of a project on agricultural mitigation under the Climate and Clean Air Coalition on Short-lived Climate Pollutants (CCAC). The project builds on collaboration between the Alliance, FAO and other partners to identify methods to reducing methane emissions from enteric fermentation. Other CCAC Projects are already either underway or in development to reduce methane from rice paddies and manure management, and black carbon from agricultural burning; and
- establishing the Livestock Emissions and Abatement Research Network (LEARN). LEARN is a collaborative, international network that facilitates the development of practical and cost-effective agricultural greenhouse gas mitigation solutions, by providing training for technicians, researchers and scientists from developing countries.

11. New Zealand looks forward to participating in the Technical Expert Meeting on the Land Sector scheduled for the June ADP meeting, as well any follow-up TEMs that may occur.

Renewable energy

12. New Zealand has abundant renewable energy resources (rivers, geothermal steamfields and sustainable plantation forestry). Development of these resources is a key priority for New Zealand's government and a focus of the *New Zealand Energy Strategy*. 73 per cent of New Zealand's electricity was generated using renewable resources in 2012, and 37 per cent of primary energy supply in that year was renewable. New Zealand has set a target of increasing the share of electricity generated from renewable resources to 90 per cent by 2025.^[2]

13. A number of new geothermal and wind energy plants have been commissioned in recent years, including the 82 MW Ngatamariki power station in 2013. The 166 MW Te Mihi station and the Mill Creek Wind farm are due to be completed by 2020.

14. Support for renewable energy projects was a key priority of the Projects to Reduce Emissions (PRE) Programme run in advance of the Kyoto Protocol's first commitment period. The main criterion of PRE was for projects to reduce emissions beyond business-as-usual reduction goals. This helped to bring forward a number of renewable energy projects that would not otherwise have been developed at that time. By the end of 2012, 19 projects were completed within the PRE programme including:

- six wind farms;
- five landfill gas projects;
- four hydro-generation projects;
- three geothermal power stations; and
- one co-generation project using off-specification gas to produce heat and electricity.

15. New Zealand's ongoing policy settings seek to ensure market incentives and the regulatory framework support efficient investment. New Zealand does not utilise inefficient fossil fuel subsidies that encourage wasteful consumption. This approach ensures our

^[2] New Zealand's Greenhouse Gas Inventory 1990-2011, released in April 2013

renewable resources are on an equal cost footing with fossil fuels in the market place. New Zealand also works with the *Friends of Fossil Fuel Subsidy Reform* to raise awareness of the abatement potential associated with the approximately \$600 billion that is spent globally on fossil fuel subsidies each year.

Scaling up mitigation by knowledge transfer and support

16. New Zealand renewable energy experts are active internationally helping other countries utilise untapped mitigation potential by increasing the use of renewable energy. New Zealand holds a seat on the International Renewable Energy Agency (IRENA) Council which works to promote the increased adoption and sustainable use of renewable energy. Engagement with multilateral agencies, such as IRENA and the Pacific Regional Infrastructure Facility, are important ways to assist developing countries to efficiently deliver energy sector projects.

17. As early adopters, New Zealand has built up several decades of experience in developing geothermal and hydro energy and significant expert capacity in geothermal and hydrological science and engineering. New Zealand is willing to assist other countries to develop their renewable energy resources, particularly by:

- helping countries to develop the people, institutional structures and processes required for sustainable renewable energy development;
- helping countries to commercially develop their renewable energy resources; and
- helping other countries to find ways to deliver greater economic value from renewable energy, for example in the development of downstream industries.

18. In the Pacific, New Zealand has worked actively to develop renewable energy resources. This has helped reduce the region's reliance on imported diesel, improved access to electricity, enabled development of energy sector strategic plans and met energy efficiency targets.

19. The March 2013 Pacific Energy Summit (co-hosted by New Zealand with the European Union) brought together donors, governments and businesses, committed to combining capital and modern technologies into scalable solutions for sustainable energy development. New Zealand's \$65 million commitment helped leverage NZ\$635 million for over 40 renewable energy projects in the Pacific.

20. Examples of other renewable energy cooperative initiatives include:

- Tokelau – The Tokelau Renewable Energy Project which took Tokelau from 100 per cent reliance on imported diesel to approximately 90 per cent of its electricity needs being met from renewables (**see Annex 2 for Tokelau case study**);
- Cook Islands - New Zealand will build eight solar generation systems and upgrade electricity distribution networks for the six islands of Rakahanga, Pukapuka, Nassau, Penrhyn, Manihiki and Palmerston. It is anticipated that once operational, the generation systems will provide over 95 per cent of the electricity demand for these islands.
- Tuvalu – New Zealand will install four mini-grid photo-voltaic/hybrid systems on the Islands of Niutao, Nanumanga, Nanumea and Vaitupu. When completed, these systems will provide over 95 per cent of the islands' power needs and will help ensure there is more reliable and efficient energy. In addition, New Zealand will provide

rooftop photo-voltaics on Funafuti and on-going technical assistance for training and operation of the systems.

- Samoa - Partnering with the European Union and the Samoan Government to provide both small and large-scale solar infrastructure into the electricity network in Apia and on Savaii. This initiative includes a 2MW solar farm in Apia Sports Complex which will be the biggest in the Pacific, all to be completed by September 2014. New Zealand will also look to support wind energy, and hydro development in the future.

21. Cooperation in developing renewable energy sources has now extended to other regions, including support for geothermal initiatives in Indonesia.

Energy efficiency

22. Reducing energy emissions is one of the four focus areas of the *New Zealand Energy Strategy 2011-2021 and Energy Efficiency and Conservation Strategy 2011-2016*. New Zealand has set a target of continuing to improve energy intensity at a rate of 1.3 percent per annum.

23. The Energy Efficiency and Conservation Authority (EECA) supports businesses to make technological and behavioural changes to improve productivity and reduce greenhouse gas emissions, particularly through information campaigns, energy audits, training workshops and industry partnerships. These initiatives focus on:

- energy efficiency improvements in meat and dairy plants;
- increased uptake of fuel-efficient tyres;
- an expansion of the existing heavy vehicle fuel efficiency programme; and
- a renewable energy 'hub' for business heat.

24. These initiatives are expected to save just under 30,000 tonnes of carbon emissions per year, leave businesses and households up to \$30 million better off over the lifetime of the investments, and ultimately catalyse energy efficiency and carbon saving in other sectors and regions. The Government expects its investment to be significantly augmented by contributions from third parties: including businesses and industry groups.

25. EECA also currently works in partnership with Australian counterparts on a joint programme on the energy efficiency of energy-using products/equipment, as well as collaborating with other countries through APEC, the IEA and other fora.

26. New Zealand found considerable value in the Technical Expert Meetings convened at the March ADP meeting on renewable energy and energy efficiency. We support calls for scheduling of follow-up meetings to allow for deeper information exchange.

Conclusion

27. This submission has highlighted a number of opportunities to scale up mitigation explored by New Zealand in the context of contributing to an ambitious global response to the problem of increasing greenhouse gas emissions. The appendices to this submission provide further detail about specific opportunities, including lessons learned and barriers overcome. New Zealand is willing to draw on this experience in collaboration with others to contribute further to meeting the WS2 goal of closing the ambition gap. We welcome interest from others, in particular, in progressing initiatives to develop carbon markets, to research

more efficient agricultural production systems, to implement energy efficiency programmes and to develop and implement renewable energy initiatives.

See attached annexes for specific case studies of New Zealand mitigation initiatives.

Annex 1: Agricultural Initiatives

Global Research Alliance on Agricultural Greenhouse Gases (the Alliance)

Description and climate benefit

The 41 member Alliance conducts research, development and extension of technologies and practices that will help deliver ways to grow more food (and more climate resilient food systems) without growing greenhouse gas emissions.

The New Zealand Government has committed NZ\$45 million to June 2019 to support the work of the Alliance. This money is available to fund research in the area of greenhouse gas emissions mitigation in pasture-based temporal livestock systems. Other activities supported by the Government's Alliance budget include collaborative research projects, scientist exchange schemes, technical workshops, capacity-building initiatives, development of guidelines on measurement and mitigation techniques, and the creation of international research networks.

Through the Alliance, New Zealand supports regional science capability building, including a collaborative project in Latin America, jointly funded with the Inter-American Development Bank's FONTAGRO fund, to assist Latin American countries in improving their national greenhouse gas inventories and developing mitigation options adapted to their farming conditions. New Zealand is a partial funder of the project (NZ\$500,000 over three years – up to June 2014) and supports the project through additional scientific training and expert review. The success of this project has led to the development of two further projects; bringing together research institutes and scientists from 12 countries across the region to measure greenhouse gases and identify mitigation options for beef cattle systems, silvo-pastoral and Andean dairy systems. New Zealand will contribute a further NZ\$600,000 to these projects.

New Zealand's support for the Alliance also includes building regional science networks and capability in developing member countries; such as an initiative in South-East Asia (Indonesia, Malaysia, Thailand and Viet Nam) to identify mitigation opportunities in the region's livestock systems. New Zealand has also supported two capability-building workshops in Africa (Nairobi in September 2012 and Accra in November 2012) and will follow up these events with a training workshop (South Africa) and a regional partners' engagement workshop (Ghana) in late 2014.

As well as delivering research on reducing emissions and building regional science capability, New Zealand's contributions to the Alliance deliver:

- improved communication of knowledge that can implement change from the Alliance Research Groups to farmers, e.g. by co-sponsoring an annual tour where World Farmers' Organisation representatives are invited to share experiences with farmers, industry and scientists in New Zealand;
- reductions in agricultural greenhouse gas emissions and other environmental impacts, particularly from pasture-based livestock systems, while continuing to improve on-farm production and economic benefits to farmers; and
- support to ensure that the challenges of increasing climate change impacts on agricultural systems and the growing global demand for food can be met through country collaboration and knowledge-sharing on agricultural research.

Co-benefits

The co-benefits of the Alliance work include improving the average efficiency of livestock farmers and research into further efficiencies in agricultural production. Efficient production can deliver synergies with adaptation and sustainable development and create co-benefits, e.g. improved water quality, erosion control and more efficient fertiliser use. Much of this work therefore provides direct synergies and benefits with regard to adapting to the impacts of climate change through increased economic and productive resilience of farm systems and farmer livelihoods.

Remaining barriers

There are several challenges involved in working in agricultural systems – most end-users are small-holder farmers, not farming a single crop or stock, but rather applying an integrated system. There are many diverse systems in agriculture with different mitigation options required depending on the breed, cultivar, climate, capability and personnel available etc. No one mitigation technology is going to be sufficient for a particular farm system globally or even nationally, therefore multiple options and practices will be required. Given the multiple pressures on small-holder farmers, policies designed to accelerate the up-take of practices to improve production efficiency, and deliver reduced emissions intensity, need to be highly sensitive to local circumstances to ensure benefits to individual farmers within their economic and socio-cultural context. Lack of farm level data makes it difficult to create structured incentives at the level of land management decision-making because mitigation actions cannot be verified.

Strategies to overcome barriers/support implementation

The Alliance was established in response to known barriers associated with reducing emissions in the agriculture sector – many countries are working on the problem, and by sharing knowledge and developing collaborative approaches the Alliance hopes to improve understanding and science capability.

It is expected that implementation costs of any technologies developed or mitigation options identified would be picked up through the partner organisations (including regional farmer organisations) that can spread this information to their established contacts and networks and ensure locally appropriate delivery and implementation.

New innovative methods are needed, such as nutrient management programmes, in order to drive continuous improvement. It is a slow process but one where New Zealand has had continual success, as emissions efficiencies have improved by approximately 20 per cent since 1990.

To deal with lack of data, New Zealand has a farm-level nutrient management model that can estimate both greenhouse gases and product life-cycle emissions on farm. This model is used heavily for water quality purposes, resulting in a high level of uptake due to the co-benefits it creates. This, in turn, is increasing the farm-level information available for farmers to make better management decisions.

New Zealand Agricultural Greenhouse Gas Research Centre

Description and climate benefit

The New Zealand Agricultural Greenhouse Gas Research Centre (NZAGRC) researches practical ways to reduce methane (CH₄) and nitrous oxide (N₂O) emissions and increase soil carbon storage while improving the productivity and efficiency of New Zealand's pastoral livestock production.

NZAGRC estimates that New Zealand delivered a reduction of 8 Mt CO₂-eq in 2011, relative to a hypothetical scenario of no efficiency improvements but the same increase in total production volume. This represents an emission reduction at the national level across all sectors of more than 10 per cent in one year. Since most of New Zealand's agricultural production is traded on the international market, this reduction in emissions intensity delivers a global climate benefit by meeting growing food demand at lower greenhouse gas emissions.

The climate benefit through the wider implementation of these efficiency gains is potentially very large, especially for grass-based production systems in Latin America, Asia and Africa looking to intensify their systems. The detailed benefits have not been quantified but could be inferred from existing reports from the FAO (2013) and the latest assessment by the Intergovernmental Panel on Climate Change (2014) if long-term trends in efficiency improvements around the world were accelerated.

Co-benefits

The main drivers for efficiency improvements in New Zealand have been improved economic performance and production by farms, both in terms of profitability per hectare and overall production levels. An added co-benefit is the decreased exposure to climate variability such as drought, through the increased use of irrigation and supplementary feeding to complement the dominant grass-based diet of dairy systems.

Remaining barriers

Opportunities to intensify farm systems and improve their efficiency depend on soil and climatic conditions, access to information and finance, and attitudes to risk and willingness to try new approaches. This is distributed unevenly across the farm sector.

In some areas, further intensification of farm systems could face barriers as the intensification involves greater leaching of nitrate from pastures into waterways, which can compromise water quality and ecosystem functioning.

Strategies to overcome barriers/support implementation

New Zealand invests heavily across government and industry to develop, demonstrate and disseminate best practice across farms to improve efficiency and increase production while reducing environmental externalities. The use of demonstration farms can showcase new approaches and their economic and environmental effectiveness.

Researchers are working closely with industry to integrate information on greenhouse gas emissions into standard industry tools to monitor nutrient budgets and other environmental issues such as nitrogen leaching, e.g. through nutrient budgeting tools.

Annex 2: Renewable Energy Initiatives

Tokelau Renewable Energy Project

Description and climate benefit

The Tokelau Renewable Energy Project (TREP) was a joint undertaking between the Government of Tokelau and the New Zealand Ministry of Foreign Affairs and Trade. Starting in 2010, New Zealand has advanced \$7 million to the Government of Tokelau to install three photovoltaic solar panels which will greatly reduce reliance on imported diesel and help achieve energy independence.

The installation of 4,032 solar panels (almost one megawatt of solar capacity in total), batteries, and inverters across the three atolls will almost entirely eliminate diesel fuel use and provide a consistent and reliable electricity supply.

The new solar power systems were designed to provide at least 90 per cent of the islands' electricity needs from solar power and they are expected to save approximately NZ\$900,000 per year in diesel costs (for a capital cost of NZ\$8.45 million).

Construction of the last TREP system was completed in late October 2012 after a 5-month construction phase for all three atolls: Fakaofu, Nukunonu and Atafu.

TREP is successfully contributing to the production of renewable solar energy across Tokelau. After its first 4 months of production TREP produced (on average) 89 per cent of the atoll's solar power needs (just below the expected figure of 90 per cent). The solar fraction is expected to increase once weather conditions improve and as operators become more familiar with operating systems.

A greater use of renewable energy will reduce Tokelau's use of diesel for electricity generation and therefore reduce greenhouse gas emissions. Over 900 tonnes CO₂-e emissions reduction will be achieved each year as a result of TREP.

Co-benefits

New Zealand's development assistance is designed with climate change co-benefits in mind. These co-benefits include building infrastructure and community resilience, increasing energy security, reducing reliance on costly diesel imports and encouraging growth in emerging green industries.

In particular, the training and capacity-building undertaken for TREP implementation was extremely effective. In order to facilitate retention of knowledge, technicians were supported with training, delivered gradually over several weeks.

TREP has also produced lower electricity costs, meaning this is a much more economically viable power option for Tokelau. Prior to the installation of the photovoltaic systems, fuel costs for the atolls were close to NZ\$1million per year, but with the new TREP system in place the cost savings are expected to be approximately NZ\$900,000 per year on fuel alone, at lowest diesel prices. Furthermore, the annual running costs of the TREP systems will be low, as maintenance will require little to no spare parts or equipment beyond what has already been provided as part of the TREP project.