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Dossier Nr. 114

Die Nationalen Klimaziele der pazifischer Staaten

United Nations
Framework Convention on
Climate Change

Inhalt: Die offiziellen Erklärungen der pazifischen Inselstaaten, Australiens, Neuseelands und Indonesiens zu ihren Klimazielen (Nationally Deter mined Contributions, NDCs bzw. Intended Nationally Determined Contri butions, INDCs) mit einem Vorwort von Oliver Hasenkamp, Pazifik-Netzwerk e.V.

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Anmerkung der Redaktion:
Das hier vorliegende Dossier enthält die offiziellen Erklärungen pazifischer Staaten zu ihren NDCs bzw. INDCs, die im Nachklang zur COP-21-Konferenz in Paris, Dezember 2015, entstanden sind.

Redaktion: Steffi Kornder, Pazifik-Informationsstelle, Neuendettelsau, 2016.

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Liebe Leserin, lieber Leser,

nach jahrelangen zähen Verhandlungen hat sich die Staatengemeinschaft im Dezember 2015 in Paris auf ein neues Klimaabkommen als Nachfolger des Kyoto-Protokolls geeinigt. Ziel des Abkommens ist es, die globale Temperatursteigerung im Vergleich zur vorindustriellen Zeit auf deutlich unter 2°C, wenn möglich auf die auch von den pazifischen Inselstaaten geforderte Marke von 1,5°C, zu begrenzen.[1]

Auf Einladung des scheidenden Generalsekretärs der Vereinten Nationen (UN), Ban Ki-moon, haben 174 Staaten das Abkommen bereits am 22. April 2016, dem diesjährigen Earth Day, in einer feierlichen Zeremonie in New York unterzeichnet. Darunter befinden sich die zwölf pazifischen Inselstaaten, die Mitglied der Vereinten Nationen sind, sowie Australien und Neuseeland. Damit hat das Pariser Klimaabkommen einen neuen Rekord aufgestellt und gilt nun als das Abkommen, das von den meisten Staaten direkt am ersten möglichen Unterzeichnungstag unterschrieben worden ist. Zwar tritt das Abkommen mit der Unterzeichnung noch nicht in Kraft, sondern erst, nachdem mindestens 55 Staaten, die insgesamt für mindestens 55% der globalen Treibhausgase verantwortlich sind, das Abkommen auch ratifiziert haben – d.h. sich basierend auf ihren nationalen Bestimmungen die Zustimmung nationaler Parlamente eingeholt haben. Doch der frühe Unterzeichnungstermin ist für viele eine Überraschung und ein starkes Signal dafür, dass das Pariser Klimaabkommen schneller als geplant in Kraft treten könnte. Für diesen oft langwierigen Prozess benötigte das Kyoto-Protokoll einst acht Jahre. Die Chancen stehen nun gut, dass das Abkommen von Paris deutlich vor dem bisher anvisierten Zeitraum im Jahr 2020 in Kraft treten könnte. Fünzehn Staaten haben das Abkommen bereits direkt im Anschluss an die Unterzeichnung ratifiziert, darunter Fidschi, die Marshall-Inseln, Nauru, Palau, Samoa und Tuvalu.

Dass es überhaupt zu dem Abkommen gekommen ist, ist auch ein Verdienst der pazifischen Inselstaaten und ihrer Verbündeten in der Allianz der kleinen Inselstaaten (AOSIS). Sie haben im Vorfeld der Konferenz beharrlich auf die Notwendigkeit eines ambitionierten Nachfolgeabkommens für das Kyoto-Protokoll hingewiesen, während der Konferenz geschickt agiert und somit mehr erreichen können, als viele Beobachterinnen und Beobachter ihnen zugetraut haben. Der Journalist Axel Bojanowski sprach auf SPIEGEL Online gar von einer „Wucht der kleinen Inselsaaten" als einem der zentralen Gründe für das Zustandekommen des neuen Abkommens.[2]

[1] Eine deutsche Übersetzung des Abkommens kann im Internet auf der Website des Bundesministeriums für Umwelt, Naturschutz, Bau und Reaktorsicherheit unter www.bmub.bund.de/fileadmin/Daten_BMU/Download_PDF/Klimaschutz/paris_abkommen_bf.pdf heruntergeladen werden.

[2] Historischer Weltklimavertrag: Zehn Gründe für das Wunder von Paris, 13.12.2015, www.spiegel.de/wissenschaft/natur/un-klimavertrag-zehn-gruende-fuer-das-wunder-von-paris-a-1067540.html.

Zugleich weisen die pazifischen Staaten zurecht darauf hin, dass nun eine umfassende und konsequente Umsetzung der Pariser Beschlüsse folgen muss und am Ende über den Erfolg des Abkommens entscheiden wird. Die pazifischen Inselstaaten gehen dabei mit ehrgeizigen Zielen zur Reduzierung ihrer Treibhausgase voran. Nicht wenige von ihnen – insbesondere die besonders kleinen und besonders stark von den Folgen des Klimawandels betroffenen Inselstaaten – nehmen sich vor, in den kommenden Jahrzehnten nahezu vollständig klimaneutral zu werden.

Ein Kernelement des Klimavertrags von Paris sind die sogenannten *Nationally Determined Contributions* (NDCs), in denen die Staaten ihre Ziele zur Reduzierung der Emission von Treibhausgasen festlegen sollen. Diese Ziele sollen, so heißt es im dem Vertrag relativ vage, ambitioniert und geeignet sein, die Zwecke des Abkommens umzusetzen. Alle fünf Jahre müssen die Staaten neue nationale Zielvorgaben einreichen, eine Änderung der Ziele ist dabei nur möglich, wenn die neuen Ziele über die zuvor gesetzten hinausgehen. Eine Liste mit allen NDCs wird in Zukunft auf der Website der Klimarahmenkonvention der Vereinten Nationen unter www./unfccc.int/focus/ndc_registry/items/9433.php erhältlich sein.

Ein Großteil der Staaten hat jedoch bereits vor oder während der Pariser Konferenz nationale Ziele bekanntgegeben. Diese bezeichnet der Klimavertrag als *Intended Nationally Determined Contributions* (INDCs). Alle Staaten, welche INDCs eingereicht haben, können diese durch Mitteilung an das UN-Klimasekretariat formlos in NDCs umwandeln – oder aber neue nationale Ziele für die ersten fünf Jahre nach Inkrafttreten des Abkommens festlegen. Anders als bei der späteren, alle fünf Jahre erfolgenden Überprüfung der nationalen Ziele können die NDCs jedoch auch weniger ambitioniert sein als die zunächst veröffentlichten inoffiziellen Ziele. Die Liste aller 162 Staaten, die INCDs vorgelegt haben, findet sich im Internet unter www4.unfccc.int/submissions/indc. Darunter befinden sich auch die Cook-Inseln, die zwar nicht Mitglied der Vereinten Nationen sind, aber ebenso wie auch Niue eigenständige Partei der UN-Klimarahmenkonvention.

In diesem Dossier wollen wir Ihnen die nationalen Klimaziele der pazifischen Inselstaaten sowie Australiens und Neuseelands vorstellen. Außerdem haben wir die Ziele Indonesiens mit aufgenommen, die auch im indonesisch besetzten Westpapua gelten. Zum Zeitpunkt der Veröffentlichung dieses Dossiers (Stand: 27.4.2016) haben weltweit insgesamt vier Staaten bekannt gegeben, ihre INDCs auch als offizielle NDCs eintragen zu lassen. Darunter befinden sich Papua-Neuguinea, das dem UN-Klimasekretariat als erster Staat am 24. März 2016 mitgeteilt hat, sein zuvor festgelegtes INDC in ein NDC umzuwandeln, und Nauru, das am 8. April 2016 folgte. Damit ist Nauru der erste Staat, der das Klimaabkommen sowohl unterzeichnet als auch ratifiziert und die erste Bedingung des Abkommens, nämlich die Erklärung von NDCs (in diesem Fall identisch mit dem INDC), erfüllt hat.

Es wird erwartet, dass die anderen pazifischen Staaten dem Beispiel von Papua-Neuguinea und Nauru folgen und ihre bereits vorgelegten informellen INDCs in offizielle NDCs umwandeln. Bei den in diesem Dossier präsentierten Zielsetzungen der pazifischen Staaten handelt es sich formal also noch um sogenannte INDCs, die im Falle Papua-Neuguineas und Naurus jedoch bereits in NDCs umgewandelt worden sind.

Wir hoffen, dass die Zusammenstellung der Zielsetzungen der pazifischen Inselstaaten zur Reduzierung ihrer nationalen Treibhausgasemissionen für Sie informativ ist und wünschen Ihnen viel Spaß bei der Lektüre. Gerne können Sie uns Ihr Feedback und Ihre Anregungen zukommen lassen.

Oliver Hasenkamp
Vorsitzender des Pazifik-Netzwerk e.V.
Berlin, 27. April 2016

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Republic of the Marshall Islands
Intended Nationally Determined Contribution

Communicated to the UNFCCC on 21 July 2015

Introduction

The Republic of the Marshall Islands (RMI) is committed to the successful conclusion of negotiations under the Ad-Hoc Working Group on the Durban Platform for Enhanced Action (ADP) in order to adopt, at COP21, a new legally-binding agreement under the UNFCCC applicable to all Parties, which will come into effect and be implemented from 2020.

In accordance with the relevant paragraphs of Decisions 1/CP.19 and 1/CP.20, RMI hereby communicates its Intended Nationally Determined Contribution (INDC) towards achieving the ultimate objective of the Convention, and provides up-front information in tabular format to facilitate the clarity, transparency and understanding of the INDC. RMI is also pleased to provide additional accompanying information, including information relating to mitigation, adaptation planning and support for implementation.

Intended Nationally Determined Contribution (INDC)

RMI commits to a quantified economy-wide target to reduce its emissions of greenhouse gases (GHG) to **32% below 2010 levels by 2025**.

RMI communicates, as an indicative target, its intention to reduce its emissions of GHGs to **45% below 2010 levels by 2030**.

These targets progress beyond RMI's Copenhagen pledge, and are based on the more rigorous data in RMI's forthcoming Second National Communication. They put RMI on a trajectory to nearly halve GHG emissions between 2010 and 2030, with a view to achieving net zero GHG emissions by 2050, or earlier if possible. This will require a significant improvement in energy efficiency and uptake of renewables, in particular solar and biofuels, as well as transformational technology, such as Ocean Thermal Energy Conversion (OTEC).

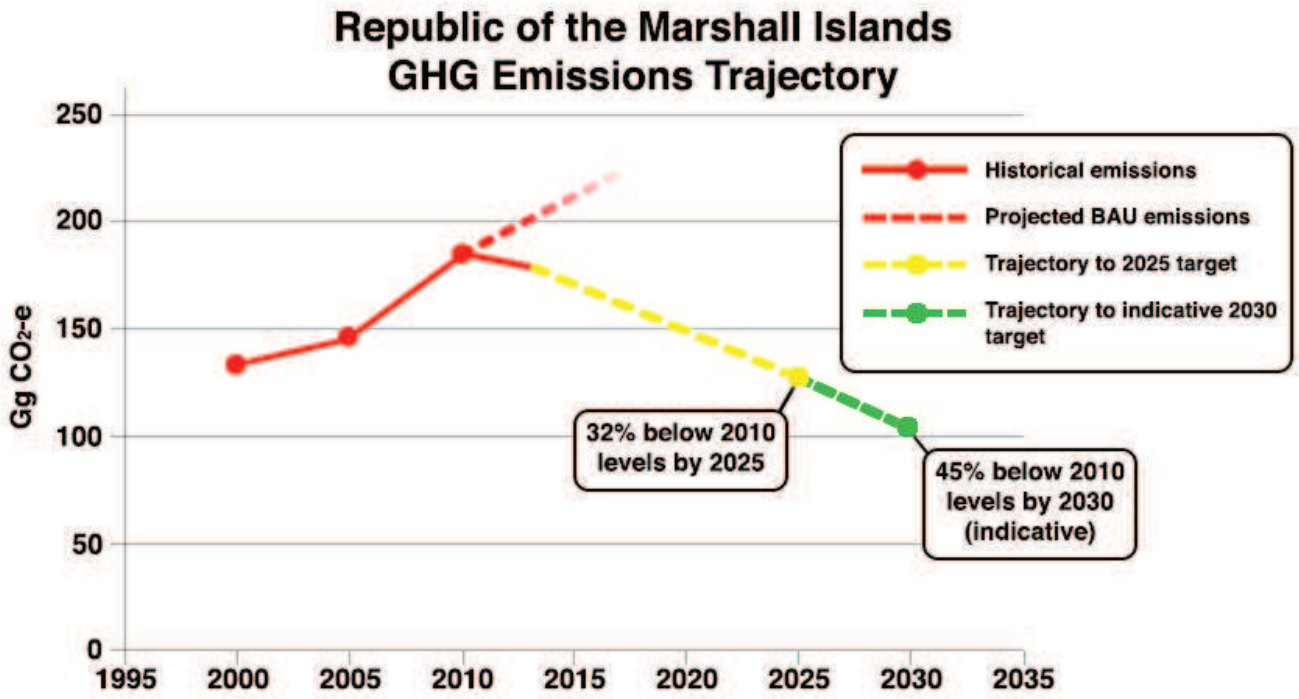
INFORMATION TO FACILITATE CLARITY, TRANSPARENCY & UNDERSTANDING

Parameter		**Information**	
Timeframe and/or period for implementation		Start year: 2020	End year: 2025
Type of commitment		Absolute economy-wide emission reduction target (excluding LULUCF)	
Reference point or base year		2010 base year (~185 Gg CO_2-e)	
Estimated quantified impact on GHG emissions		Commitment to reduce GHG emissions by 32% below 2010 levels by 2025 Indicative target to reduce GHG emissions by 45% below 2010 levels by 2030	
Coverage	% national emissions	~100%	
	Sectors	• Energy - Electricity Generation - Transport (land and shipping) - Other (cooking and lighting) • Waste [Note: emissions from sectors not listed are negligible]	
	Gases	Carbon dioxide (CO_2) Methane (CH_4) Nitrous Oxide (N_2O) [Note: emissions of GHGs not listed are negligible]	
	Geographical boundaries	Whole of country	
Intention to use market-based mechanisms to meet target		No	
Land sector accounting approach		N/A	
Metrics and methodology		Consistent with methodologies used in RMI's forthcoming Second National Communication (1996 IPCC Guidelines).	

Parameter	Information
Planning process	RMI's INDC was developed through an all-inclusive process of engaging relevant stakeholders in and outside government, including the country's first National Climate Change Dialogue and three rounds of stakeholder consultations. This process has produced genuine national ownership of the INDC and highlighted synergies with other UNFCCC-related processes, including National Communications, Biennial Update Reports, National Adaptation Planning, and Nationally Appropriate Mitigation Actions (NAMAs).
Fair and ambitious	RMI's emissions are negligible in the global context (<0.00001% of global emissions). According to data reflected in RMI's forthcoming Second National Communication, RMI's emissions peaked around 2009 and have been trending downwards since, in line with the goals in the National Energy Plan and National Climate Change Policy, based on the 'National Climate Change Roadmap' (2008). Given its low GDP per capita (approx. USD3,600[1]), extreme vulnerability and dependence on external support, RMI's proposed targets are ambitious compared to those proposed by other countries and measured against any objective indicators. They put RMI on a trajectory to nearly halve GHG emissions between 2010 and 2030, with a view to achieving net zero GHG emissions by 2050, or earlier if possible. RMI's pursuit of an absolute, economy-wide emission reduction target is a far more ambitious approach than the contemplation in Decision 1/CP.20 that "LDCs and SIDS may communicate information on strategies, plans and actions for low GHG emission development…" (para. 11)

[1] World Development Indicators (2013), World Bank.

RMI's historical GHG emissions from 2000 to 2010 (per the forthcoming Second National Communication) and the estimated emissions trajectory reflected in the new targets contained in the INDC are illustrated below:



ACCOMPANYING INFORMATION ON RMI'S INDC

General Information

The Republic of the Marshall Islands (RMI) is a Small Island Developing State and home to nearly 70,000 people, scattered across 24 low-lying coral atolls in the North Pacific. With an average elevation of 2 metres, RMI is uniquely vulnerable to the impacts of climate change. Though RMI's total greenhouse gas emissions are negligible on a global scale, the country takes its national motto, "Jepilpilin ke ejukaan" ("Accomplishment through joint effort"), very much to heart. RMI recognizes that it has a role to play in the global effort to combat climate change, demonstrating that even with its limited means it will undertake the most ambitious action possible.

Since its independence, RMI has been heavily reliant on external assistance, with grants averaging 60% of Gross Domestic Product (GDP). International support will remain important as RMI fulfils its National Strategic Development Plan: Vision 2018[2] (NSP). The NSP provides a general framework for sustainable development, and contains linkages to climate change and disaster risk management through its goal of environmental sustainability. It is a guide for development and progress in the medium term, through a three-year rolling plan, and will be updated continually for use in meeting longer-term objectives as RMI moves towards the scheduled completion of funding under "The Compact of Free Association, as Amended" in 2023[3].

Mitigation

Current Status

The estimated sectoral mix of RMI's anthropogenic GHG emissions (CO_2-e), as calculated for 2010 in the forthcoming Second National Communication, is as follows: electricity generation (~54%), land and sea transport (~12%),waste (~23%), and other sectors (~11%).

Almost 90% of national energy needs are currently satisfied by imported petroleum products, although biomass remains important for cooking and crop drying on outer islands. All CO_2 emissions are the result of combustion of imported fossil fuels in five sectors:

- Electricity generation;
- Sea transport;
- Land transport;

[2] Vision 2018, RMI Government, 2001
[3] RMI Decrement Management Plan, 2015-2023

- Kerosene for lighting on outer islands; and
- LPG, butane and kerosene for cooking.

Like other island nations in the Pacific, RMI suffers from high and volatile fuel prices, while lacking any known fossil fuel reserves of its own.

Following a major fuel price spike in July 2008, the RMI Government declared a state of economic emergency. This quickly drew national attention to the need to reduce the reliance on imported fossil fuels, and to scale-up renewable energy as a replacement. Prior to 2008, the emphasis had been mainly on small-scale solar for the households of the outer islands. However, since 2008, there has been a rapid expansion of solar investment to add renewable energy generation to the existing diesel-powered grids on the urban islands. This, along with the introduction of supply-side efficiency measures by the Marshalls Energy Company (MEC) and demand-side load reductions, has led to a recent decline in fuel oil usage for electricity generation.

The vision for the proposed 2014 National Energy Policy (NEP) is "an improved quality of life for the people of the Marshall Islands through clean, reliable, affordable, accessible, environmentally appropriate and sustainable energy services." Reducing fossil fuel imports is the major goal, with the uptake of renewable energy and further energy efficiency improvements on both the demand and supply sides expected to replace more than one-third of fossil fuels for electricity and transport by 2030.

A monitoring plan has been developed as part of the National Energy Policy to tie the key strategies of the energy sub-sectors to the overall vision of the energy sector and the Vision 2018. The guiding principles for implementing this Policy are aligned with the principles adopted for national, sub-regional, regional and international initiatives, which include the Micronesian Energy Initiative, the Regional Framework for Action on Energy Security in the Pacific (FAESP), and the Sustainable Energy for All Initiative Goals.

Planned Actions

In preparing its INDC, RMI considered various scenarios for the potential contribution of renewable energy and energy efficiency initiatives in the power generation and transport sectors, as well as the potential role of measures to reduce emissions from the waste, cooking and lighting sectors.

As currently estimated, progress towards achieving RMI's targets would entail reducing emissions from: the electricity generation sector by 55% in 2025, and 66% in 2030;

transportation (including domestic shipping) by 16% in 2025 and 27% in 2030; waste by 20% by 2030; and 15% from other sectors (cooking and lighting) by 2030.

Specific areas of action contemplated to make progress towards the INDC targets include:

- Ground and roof mounted solar with associated energy storage;
- Ongoing demand-side energy efficiency improvements (e.g. prepayment meters, end user efficiency improvements);
- Supply-side energy efficiency improvements (e.g. new engines and system upgrades, heat recovery from engines)
- Small scale wind-powered electricity generation;
- Replanting and expansion of coconut oil production for use in electricity and transport sectors blended with diesel;
- Vehicle inspections and maintenance;
- Introduction of electric vehicles, and emission standards for current vehicles;
- Introduction of solar-charged electric lagoon transport;
- Reduction in methane production in landfills through pre-sorting of waste and entrapment of methane;
- Transition to electric and solar cook stoves from LPG cook stoves;
- Reduction of kerosene for lighting in outer atolls; and
- Additional GHG reductions may become possible through the use of new technologies allowing the extraction of ocean energy for power generation.

Many of these actions will depend on the availability of the necessary finance and technology support, as described in the section on “Support for Implementation.”

Efforts to overachieve

RMI will undertake the strongest possible efforts to achieve and, where possible, over-perform on the commitment in its INDC.

For example, should potential plans and specific pathways for deployment of OTEC be clarified, and should practical, island-driven application be proven, this would have the potential to allow RMI to substantially over-perform on its present commitment. Further, should additional technological developments occur, and cost barriers be reduced, further progress could be possible in all relevant sectors, including energy generation and transportation. RMI looks forward to the opportunity to consider the possible deepening of its emission reduction trajectory when it seeks to update its mitigation commitment in five years’ time.

Adaptation

While RMI considers that the focus of INDCs should primarily be mitigation, we note the invitation to Parties in Decision 1/CP.20, para. 12 to "consider communicating their undertakings in adaptation planning or consider including an adaptation component in their INDCs".

RMI's people are among the most vulnerable in the world to the impacts of climate change. Many of these impacts are already occurring, inflicting damage and imposing substantial costs on the Marshallese government and people – costs that will only increase in the coming years.

RMI is committed to the strongest possible efforts in safeguarding security and human rights, as well as advancing development aspirations, in light of projected climate impacts and risks. RMI has no choice but to implement urgent measures to build resilience, improve disaster risk preparedness and response, and adapt to the increasingly serious adverse impacts of climate change. RMI commits to further developing and enhancing the existing adaptation framework to build upon integrated disaster risk management strategies, including through development and implement of a national adaptation plan (and further integration into strategic development planning tools), protecting traditional culture and ecosystem resources, ensuring climate-resilient public infrastructure and pursuing facilitative, stakeholder-driven methods to increase resiliency of privately-owned structures and resources. RMI seeks to consider, as appropriate, the legal and regulatory means to best support these approaches.

RMI also considers that adaptation action will have mitigation co-benefits, with efforts such as mangrove and agriculture rehabilitation programs likely to enhance carbon sinks as well as assist with protection of water resources and the health of the RMI people.

The RMI National Climate Change Policy Framework (NCCPF) sets out the Government of RMI's commitments and responsibilities to address climate change. This policy framework is intended to guide the development of adaptation and energy security measures that respond to RMI's needs with an "All Islands Approach", foster an environment in which the RMI can be better prepared to manage the current and future impacts of climate change while ensuring sustainable development, and provide a blueprint for building resilience in partnership with regional and global partners.

In the NCCPF, RMI has identified a series of priority areas for urgent response. It is clear that RMI faces major impacts on its communities' livelihoods and infrastructure from sea-level rise, sea surges, typhoons and rainfall intensity; water and food security issues from

changing rainfall patterns and ocean acidification; health issues from rising temperatures and prolonged drought periods, as well as the potential for increasing peak wind speeds and changes to ocean circulation patterns.

In addition to the NCCPF, RMI has also developed an innovative Joint National Action Plan (JNAP) for Climate Change Adaptation and Disaster Risk Management National Action Plan (DRM NAP) that sets out actions to adapt against the effects of natural disasters and climate change.

The JNAP is an important and integral supportive element towards the achievement of RMI's sustainable national development imperatives. The JNAP's strategic goals, which are a combination of those addressed in the DRM NAP and the National Climate Change Policy Framework (NCCPF), are as follows:

- Establish and support an enabling environment for improved coordination of disaster risk management /climate change adaptation in the Marshall Islands;
- Public education and awareness of effective CCA and DRM from the local to national level;
- Enhanced emergency preparedness and response at all levels;
- Improved energy security, working towards a low carbon emission future;
- Enhanced local livelihoods and community resilience for all Marshallese people; and
- Integrated approach to development planning, including consideration of climate change and disaster risks.

RMI intends on regularly updating its climate vulnerability assessments and subsequently build on its existing policies to meet its ultimate goal of minimizing impacts and harm incurred by the Marshallese people. At all steps of the way, local stakeholders will be consulted to ensure community needs are best served.

Support for implementation

Climate change is a cross-cutting development issue that affects every aspect of the Marshallese way of life, and it is imperative for RMI to collectively build and strengthen its drive to a low-carbon economy and resilience to climate change impacts. RMI looks to regional and global cooperation for support in pursuit of these mitigation and adaptation-related development priorities.

While RMI considers its INDC as a full national commitment to be undertaken without pre-conditions, the country is at present heavily reliant on external assistance for capacity and

financial resources in key national sectors. As a small economy, minor perturbations can lead to substantial changes in energy needs and related emissions trajectories. If national circumstances change, RMI will to the best of its ability stay on course to achieve its emissions targets. While longer-term national projections are uncertain, and private sector growth is imperative, it is evident that external assistance will continue to be important in achieving many national development objectives.

The rapid development of energy–intensive economic activities intensified RMI's dependence on imported petroleum products, particularly in the period 2000 to 2010. The high cost of these products remains a fundamental obstacle to improving standards of living and business profitability in the country. The RMI Government is currently supported by donors and development partners to mitigate impacts of high oil prices at policy level, focused on increasing energy efficiency, minimizing the costs of imported fuels, and investing in renewable energy sources such as solar, biofuel and ocean energy.

Specifically, international support is critical to enable RMI to implement the actions enshrined in its National Energy Policy, Climate Change Policy, Joint National Action Plan, National Strategic Plan and other sectoral policies and plans. It is also important to note that RMI has made substantial progress in implementing its 2009 National Energy Plan (up to 2020), but important gaps remain, particularly in the area of private investment. RMI will need international support for is efforts to transition towards a low-emissions energy sector through greater use of renewables such as solar, biofuels and wind, and potential use of transformational technology, such as OTEC.

Finally, RMI will need substantial assistance to meet its adaptation objectives outlined in the prior section. As a highly vulnerable and low-lying island nation with no major points of elevation above 2 metres, RMI already experiences frequent and serious climate impacts, as well as natural hazard events. These impacts will continue to pose serious challenges across the full spectrum of RMI's development prospects and priorities.

AUSTRALIA

Australia's Intended Nationally Determined Contribution to a new Climate Change Agreement | August 2015

I. Australia's commitment

Australia wants the United Nations climate change conference in Paris to deliver a strong and effective new global climate change agreement, applicable to all UNFCCC Parties.

Australia has a strong record of meeting our commitments, and we are on track to meet our 2020 target. Our direct action policy, including the Emissions Reduction Fund, is supporting businesses and the community to reduce emissions, while improving productivity and sustaining economic growth.

Australia will continue to play our part in an effective global response to climate change. Under a Paris Agreement applicable to all, Australia will implement an **economy-wide target to reduce greenhouse gas emissions by 26 to 28 per cent below 2005 levels by 2030.** The details of Australia's contribution are set out in the attachment to aid transparency, clarity and understanding.

Australia's target is unconditional based on assumptions set out in the attachment. We will implement the 28 per cent target should circumstances allow, taking into account opportunities to reduce emissions and factors such as the costs of technology. Australia reserves the right to adjust our target and its parameters before it is finalised under a new global agreement should the rules and other underpinning arrangements of the agreement differ in a way that materially impacts the definition of our target.

II. A fair and ambitious contribution to deliver the Convention's objective

Australia's intended nationally determined contribution is an ambitious, fair and responsible contribution to global efforts toward meeting the objective of the UNFCCC with the goal of limiting global average temperature rise to below two degrees Celsius.

The target is a significant progression beyond Australia's 2020 commitment to cut emissions by five per cent below 2000 levels (equivalent to 13 per cent below 2005 levels). The target approximately doubles Australia's rate of emissions reductions, and significantly reduces emissions per capita and per unit of GDP, when compared to the 2020 target. Across a range of metrics, Australia's target is comparable to the targets of other advanced economies. Against 2005 levels, Australia's target represents projected cuts of 50 to 52 per cent in emissions per capita by 2030 and 64 to 65 per cent per unit of GDP by 2030.

The target represents serious and ambitious effort for Australia. This effort takes account of Australia's unique national circumstances, including a growing population and economy, role as a leading global resources provider, our current energy infrastructure, and higher than average abatement costs. The target places Australia on a stable pathway towards longer term emissions reductions in the context of future global action and technological innovation.

III. Planning processes towards achieving Australia's target

Australia's Emissions Reduction Fund supports Australian businesses to reduce emissions while improving productivity. The first auction under the Fund was held in April 2015, and successfully purchased over 47 million tonnes of abatement at an average price of AU$13.95. The Government is finalising a safeguard mechanism to ensure emissions reductions purchased under the Fund are not offset by significant rises in emissions elsewhere in the economy. Australia has additional policy measures in place to promote the deployment of renewable energy and improve energy efficiency. Under Australia's Renewable Energy Target scheme, over 23 per cent of Australia's electricity will come from renewable sources by 2020.

The Australian Government is working to build climate resilience and support adaptation to climate change. Australia will develop a National Climate Resilience and Adaptation Strategy during 2015.

The Australian Government is commencing the development of a range of policies that will reduce emissions into the post-2020 period, including a National Energy Productivity Plan with a National Energy Productivity Target of a 40 per cent improvement between 2015 and 2030, the investigation of opportunities to improve the efficiency of light and heavy vehicles, and the enhanced management of synthetic greenhouse gas emissions under ozone protection laws and the Montreal Protocol.

Building from these measures, the Australian Government will in 2017-2018 undertake consultation to determine further post-2020 domestic emissions reduction policies. The Government will ensure that policies used in the post-2020 period are efficient and complementary with one another, and are appropriately calibrated towards achieving Australia's 2030 target. As a part of this process, the Government will consider a potential long term emissions reduction goal for Australia, beyond 2030, taking into account international trends and technology developments.

Attachment: Australia's intended nationally determined contribution

Target: 26 to 28 per cent below 2005 levels by 2030

Reference point	
Base year	2005
Time frames	
Period covered	2021 – 2030
Scope and Coverage	
Target type	Absolute economy-wide emissions reduction by 2030, to be developed into an emissions budget covering the period 2021-2030
Gases covered	Carbon dioxide (CO_2); Methane (CH_4); Nitrous oxide (N_2O); Hydrofluorocarbons (HFCs); Perfluorocarbons (PFCs); Sulphur hexafluoride (SF_6); Nitrogen trifluoride (NF_3)
Sectors covered	Energy; Industrial processes and product use; Agriculture; Land-use, land-use change and forestry; Waste
% of base year emissions covered	100 per cent of greenhouse gas emissions and removals in Australia's national greenhouse gas inventory
Assumptions and methodological approaches for emissions estimates and accounting	
Metrics	Australia intends to apply 100 year Global Warming Potentials (GWPs) as contained in inventory reporting guidelines, currently IPCC Fourth Assessment Report 100 year GWPs, or as otherwise agreed.
Emissions estimation methodology	Australia intends to apply the IPCC 2006 Guidelines and IPCC 2013 Revised Supplementary Methods, or as otherwise agreed.
Accounting approach	Australia intends to account based on UNFCCC inventory reporting categories using a net-net approach. Australia will apply IPCC guidance for treatment of natural disturbance and variation. Australia's INDC assumes that accounting provisions under the Paris agreement will: - Preserve the integrity of the agreement by ensuring claimed emissions reductions are genuine and are not double counted; and - Recognise emissions reductions from all sectors.
Australia reserves the right to adjust our target and its parameters before it is finalised under a new global agreement should the rules and other underpinning arrangements of the agreement differ in a way that materially impacts the definition of our target.	

INTENDED NATIONALLY DETERMINED CONTRIBUTIONS

COOK ISLANDS

Introduction

The Cook Islands is a small island developing state comprising of 15 small islands with an exclusive economic zone (EEZ) of nearly 2 million sq km in the South Pacific Ocean. Globally, the Cook Islands contributes to only 0.00012% of GHG emission, which is an insignificant amount relative to the total global emission of 2004 (IPCC Report, 2007). Yet, collectively, the consequences of the global emission via climate change is detrimental to ecosystems, infrastructures, economy, and therefore the livelihood of Cook Islanders.

The Cook Islands has carved a pathway of low carbon development to strengthen climate resilience and further reduce its carbon footprint to achieve its national vision, which is 'to *enjoy the highest quality of life consistent with the aspirations of our people, and in harmony with our culture and environment*'.

The Cook Islands believes that by aspiring to its national vision it is striving to keep the overall global average temperature rise below 1.5 degrees Celsius.

Mitigation

Based on the 2006 GHG inventory, the Cook Islands' emission was estimated at 69,574 t CO_2^-e, which contributes to 0.00012% of the 2004 global GHG emission (IPCC, 2007).

The energy sector alone contributed 79% of the total emission for 2006, with 34% attributed to electricity generation (Figure 1).

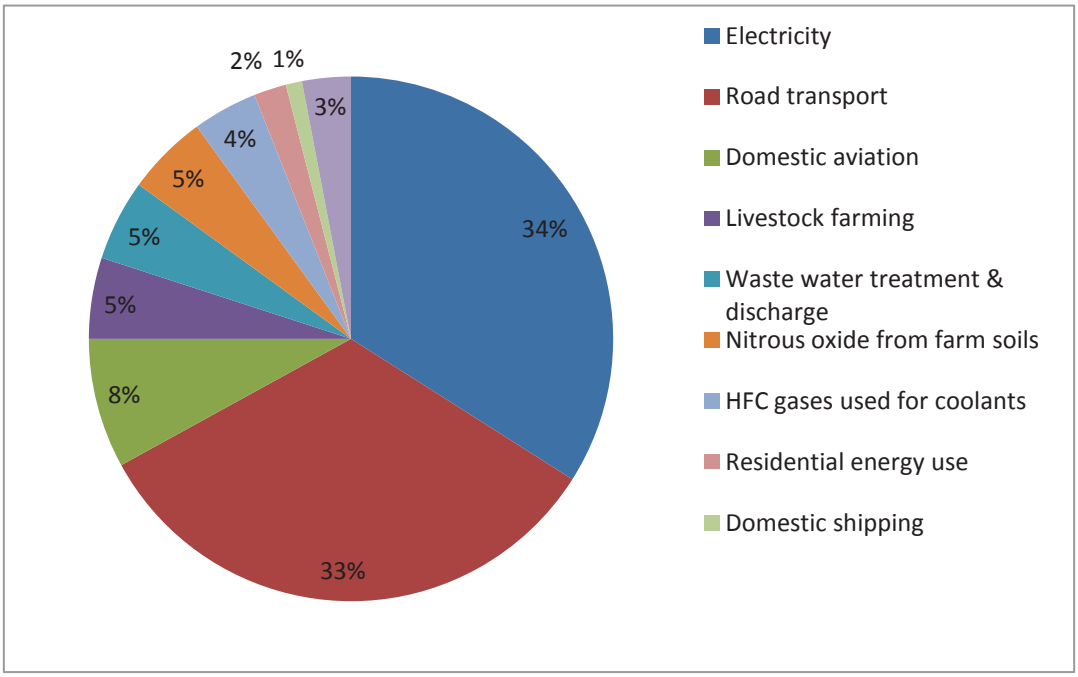


Figure 1. Breakdown in national emission by activity for 2006 (Second National Communications, 2011)

The Cook Islands is committed to a future powered by renewable energy with targets of 50% of islands transformed from diesel based to renewable sourced electricity by 2015, to 100% coverage by 2020 (Cook Islands Renewable Electricity Chart, 2011). To date, the Cook Islands has achieved its 50% target and is on track to achieving the 2020 target. Using 2006 as the base year, emission from electricity generation will be reduced by 38% by 2020 (Figure 2). The Cook Islands has formally submitted a Nationally Appropriate Mitigation Action (NAMA) under the United Nations Framework Convention on Climate Change for supporting implementation of 100% renewable electricity by 2020.

To ensure sustainability and the credibility of its efforts, the Cook Islands will endeavour to put in place the appropriate structures to monitor, evaluate and pursue value added activities. These will include *inter alia* undertake the construction of additional and new grid storage, integration of improved energy efficiency and new technologies, technology transfer, and strengthening capacities for overall sustainability and co-benefits. This would reduce emissions from electricity generation by a further 43%, totalling an 81% emissions reduction by 2030 (relative to 2006). This further reduction is conditional on receiving external support.

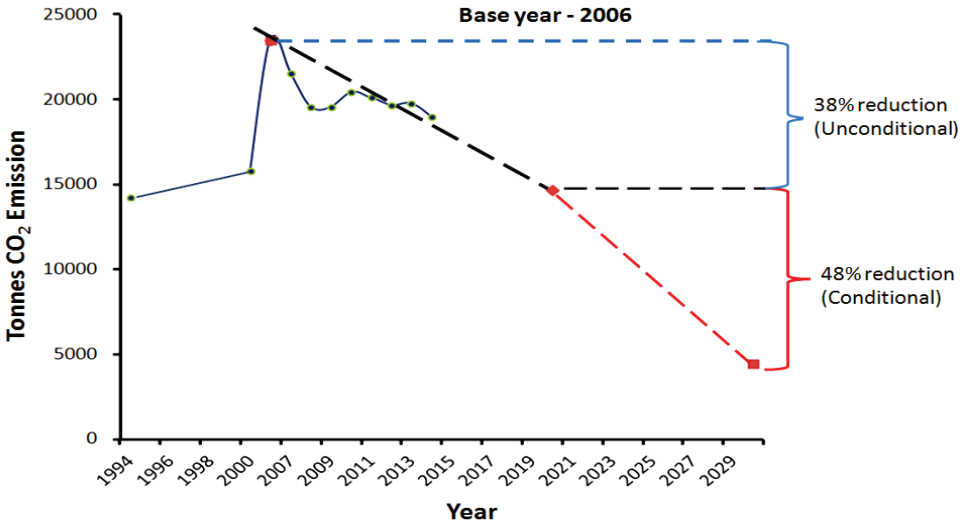


Figure 2. Electricity emission from 1994 to 2014. The Cook Islands base year is 2006 (blue dash line) and an unconditional target of 38% reduction by 2020. A conditional reduction of 43% by 2030, making a total reduction of 81% in the electricity sub sector.

Given that the transport sub sector is the second highest GHG emitter in the Cook Islands, the Customs Tariff Act 2012 establishes noteworthy duty rates on the importation of motor vehicles. Additionally, the Cook Islands is looking to embrace proven low carbon transport technologies and is currently exploring the most effective incentives for promotion of transition towards clean energy transportation. This will further reduce our overall emissions, conditional on external support.

Adaptation

Unconditional

Given the Cook Islands size, vulnerabilities, limited resources, and capacities whilst noting also its special circumstances, designating its entire EEZ of almost two million sq km as a marine park is evidence of national commitment to the global effort to building the resilience of marine ecosystems.

The country has developed key plans and policies that articulate its priorities to reduce vulnerability and strengthen resilience. This includes the first 20 year national vision '*Te Kaveinga Nui',* accompanied by the first National Sustainable Development Plan (NSDP) 2007-2010, and subsequently the second NSDP 2011-2015 with the latest 2015-2020 to follow. The Joint National Disaster Risk Management and Climate Change Adaptation Plan (JNAP) is a

five-year (2011–2015) roadmap that is currently being updated to 2020. The Climate and Disaster Compatible Development Policy 2013-2016, provide direction for more coordinated adaptation and mitigation actions within and across all sectors. The Renewable Energy Chart provides the pathway of transforming the electricity sector from diesel based to renewable energy sources.

The Cook Islands is confident that its existing frameworks and robust systems guiding ongoing climate change mitigation and adaptation measures are considerable, and its commitments are ambitious to the global goal despite its unique circumstances.

Conditional

Note that Loss and Damage is not factored into the policy and planning processes outlined above. Nor are the full costs associated with building resilience to climate change, which the Cook Islands expects will be covered by the international community over time.

The Cook Islands is confident that its strategies and policies pre 2020 and post 2020 will reduce and offset its carbon emissions and strengthen resilience. These actions include *inter alia* coastal protection, water security, agriculture, forestry, marine conservation, waste, tourism and land management.

The Cook Islands is confident that it can deliver 100 per cent of its adaptation measures, provide tools and technologies and strengthen capacities in all its inhabited islands, conditional to external support.

Cook Islands reserves the right to adjust this target and its parameters subject to the outcome of COP21 and to external support.

A fair and ambitious contribution under the Convention

Cook Islands intended nationally determined contribution is fair, ambitious and responsible given its special circumstances and considering that its total global GHG emission is negligible.

Fiji's Intended Nationally Determined Contribution

1.0 National Circumstances

Physical characteristics[1]

Fiji lies between 177° E and 178° W Longitude and 12° to 22° S Latitude with a land area of 18,333 km2 and an exclusive economic zone of 1.3 million square kilometers. This includes 332 islands of which about a third are inhabited. The majority of the land is on continental-like volcanic islands that rise to well over 1,000 meters in elevation. Over 87% of the land is concentrated in the islands of Viti Levu and Vanua Levu. Fiji's climate is tropical, averaging 26°C with annual rainfall ranging from 1800 to 2600 mm. It is considerably richer in natural resources than its Polynesian and Micronesian neighbors with extensive timber, rich soils, mineral deposits and fish. The country is subject to earthquakes, landslides, cyclones, flooding, and storm surges.

Population

The latest census was undertaken in 2007 and shows a population of 837,217 (2007) and an annual population growth of 0.8%. During the last two decades, the national population growth rate has remained relatively low by Pacific Island standards. Given the continuation of the present growth rates for the different ethnic groups, it is estimated that the population for Fiji will reach the one million mark in 2030 and that by 2030, 61% of the population will be urban.

The Economy

The World Bank classifies Fiji as a lower middle-income economy[2] with a per capita GDP in 2011 reported to be US$ 4,397. Fiji's growth has been extremely volatile as a result of a series of external and internal shocks. These include a series of natural disasters (cyclones in 1985, 1992, 1993, 2009, and 2010); two global oil shocks (in 1979 and in 1981–1982); the Asian financial crisis (1997); spikes in food and fuel prices (2008); the global economic crisis (2009 and 2010); and, more recently, severe flooding in the Western and Northern Divisions of the country (January 2012 and late March 2012) followed by Tropical Cyclone Evan in December 2012.[3]

Fiji, as a small island developing state and because of its location is more vulnerable and is at the forefront of being impacted by climate change. Despite contributing a mere 0.04% of greenhouse gas emission to the atmosphere compared to the global average, Fijian communities are experiencing climate change impacts such as eroding shorelines and riverbanks, shortage of water, depleted fisheries stock, reduced food production, large-scale flooding, increase in outbreaks of vector borne diseases and sea level rise. The Fijian government therefore recognizes the importance of adapting to climate change and coordinating climate change related adaptation policies, strategies, plans, and activities to reduce the vulnerability and enhance the resilience of Fiji's communities to the impacts of climate change and disasters.

[1] Sustainable Energy for All (SE4All): Rapid Assessment and Gap Analysis
[2] http://data.worldbank.org/country/fiji
[3] Fiji 2012: Revitalizing the Fiji economy, Mandaluyong City, Philippines

The climate of Fiji is generally categorized as an oceanic tropical marine climate and varies over different timescales. The major features that drive Fiji's climate are: the El Nino Southern Oscillation (ENSO) phenomenon that occurs every four years on average, the South Pacific Convergence Zone and the Trade Winds.

Fiji signed the United Nations Framework Convention on Climate Change (UNFCCC) in 1992 and ratified it in 1993. Fiji's commitments to this Convention are outlined in the National Climate Change Policy of 2012. The Mauritius Strategy 2005-2015 and the Barbados Plan of Action 1994, which attempt to address the problems of small island developing states (SIDS) have climate change as a significant issue. Fiji will continue to contribute to the implementation of the Post 2015 SAMOA Pathway (through the implementation of the National Climate change Policy.
Also at the regional level, the Pacific Island Framework for Action on Climate Change 2006-2015 is focused on building the resilience of communities to combat the impact of climate change. A successor regional framework that incorporates elements of Disaster Risk Management is being negotiated.

Fiji is currently undergoing essential sectoral policy and institutional reform that involves the review and update of existing legislation and policies. The focus of the reform is to ensure sustainable economic and social development and thereby improve the livelihoods of all communities in Fiji.

Policies have been developed in the areas of agriculture, land use, forestry, fisheries and water. They focus on the sustainable management of Fiji's natural resources and the establishment of appropriate institutional arrangements for effective implementation and monitoring. A major component is the incorporation of environmental management in order to address issues that emanate from natural hazards and unsustainable resource management and utilization. These policies play an important role in supporting efforts to reduce adverse impacts of climate change on Fiji's economic and social development.

Climate change constitutes one of the greatest barriers to sustainable development. It puts Fiji's biodiversity and ecosystems, particularly marine and coastal, at risk. This has severe implications for Fiji's economic growth, as the country relies heavily on its natural resources for economic development; fisheries, forestry and agriculture are its primary industries. The effects of climate change are widespread and cross-sectoral. Effective co-ordination of a multi-disciplinary approach and a well-established government position on issues and policies will need to be strengthened to effectively address the impacts of climate change.

2.0 Fiji's Intended Nationally Determined Contribution

In accordance with the relevant paragraphs of Decisions 1/CP.19 and 1/CP.20, Fiji hereby communicates its Intended Nationally Determined Contribution (INDC) towards achieving the ultimate objective of the Convention, and provides up-front information in tabular format to facilitate the clarity, transparency and understanding of the INDC. Fiji is also pleased to provide additional accompanying information, including information relating to mitigation and adaptation planning.

The achievement of the emission reduction target specified above will be through both unconditional and conditional means based on available and additional external financing being made available to Fiji. From the 30% emission reduction target, 10% will be achieved through the implementation of the Green Growth Framework, utilizing resources available in country (unconditional) whereas the remaining target can only be met with the availability of external funding amounting to US$500 million (conditional).

Whilst Fiji's iNDC is specific to the energy sector, further accounting will need to take place to incorporate the mitigation potential of Fiji's Forestry sector via the REDD+ programme, and other critical sectors.

INFORMATION ON INTENDED NATIONALLY DETERMINED CONTRIBUTIONS OF FIJI			
PARTY: Fiji		**DATE: 20 October, 2015**	
Parameter		**Information**	
Period for defining actions		Start year: 2020	End year: 2030
Type and level of Commitment		Sector specific reduction focusing on a renewable energy target for electricity generation. In addition a general emissions reduction by improvements in energy efficiency economy wide. The target is for the renewable energy share in electricity generation to approach 100% by 2030 from around 60% in 2013. In addition an indicative reduction of 10% CO_2 emissions for energy efficiency improvements economy wide will be sought. These measures will reduce CO_2 emissions in the energy sector by around 30% from BAU by 2030.	
Reference year or period		2013	
Estimated, quantified emissions impact		A business as usual (BAU) scenario for total fossil fuel increases for energy production for extrapolated population and economic growth would give total CO_2 emissions in 2030 from the energy sector of around 2500 Gg with an electricity sector CO_2 emission level of around 500 Gg. With the energy sector reductions the emissions in 2030 would thus be around 1800 Gg A close to 100% renewable target would thus reduce BAU emissions by 20%. The additional sector wide energy efficiency reduction of 250Gg or 10% of 2030 emissions would give a total reduction of 30% over BAU for 2030.	
Baseline		The electricity sector CO_2 emissions in 2013 were 340 Gg. The 2013 baseline total energy sector CO_2 emissions were close to 1500Gg.	
Coverage	% National emissions (as at 2013)	1.5 million tonnes of CO_2 from the Energy sector	
	Sectors	Energy target as above	

INFORMATION ON INTENDED NATIONALLY DETERMINED CONTRIBUTIONS OF FIJI		
PARTY: Fiji		**DATE: 20 October, 2015**
Parameter		**Information**
	Gases	CO_2
	Geographical boundaries	Nation-wide
Further information, relevant to commitment type, required for the purpose of providing Clarity, Transparency and Understanding		Fiji's target is consistent with that laid out in the Green Growth Framework and is also aligned with the Sustainable Energy for All (SE4ALL) initiative of the United Nations. Fiji's target is based on modelling future energy balances and based on best available historical data for both supply and demand side of the national energy balance. The Government policy favours a diversified renewable energy portfolio including hydro, geothermal, biomass and grid connected solar and wind but further feasibility studies need completing before the final mix is determined. **Conditionality:** The achievement of the emission reduction target specified above will be through both unconditional and conditional means based on available and additional external financing being made available to Fiji. From the 30% emission reduction target, 10% will be achieved through the implementation of the Green Growth Framework, utilizing resources available in country (unconditional) whereas the remaining target can only be met with the availability of external funding amounting to US$500 million (conditional).
Intention to use market based mechanisms to meet commitments		In order to achieve rapid and cost efficient mitigation, a combination of robust global market based mechanisms and direct aid transfers will be essential. Achieving our conditional goal will require substantial funding including fully functional bilateral, regional and international market mechanisms such as the Clean Development Mechanism (CDM)
Land sector accounting		N/A

INFORMATION ON INTENDED NATIONALLY DETERMINED CONTRIBUTIONS OF FIJI	
PARTY: Fiji	**DATE: 20 October, 2015**
Parameter	**Information**
approach	
Estimated macro-economic impact and marginal cost of abatement	A reduction in the cost of imported fuels equivalent to around 200 million litres of diesel and or heavy fuel oil by the year 2030 over BAU imports. Improved energy security and reduction on the dependence on imported fuel as a source of energy for electricity generation.
Narrative supporting the fair-share assessment of the contribution	Fiji's per capita 2013 CO_2 emissions are estimated to be around 1.5 tonnes compared to the world average of 5.6 tonnes. Fiji is a developing country and has historically not been responsible for the emissions of the developed world. Fiji will do the best to mitigate but not at the expense of raising the standard of living for the poor of the country. As such Fiji's INDC commitment must be contingent on obtaining international funding to proceed with mitigation options.
Description of key domestic policies and measures giving effect to commitment	Green Growth Framework 2014 Draft Energy Policy 2013 Draft Energy Strategic Action Plan 2013 Sustainable Energy for All (SE4All) global report Fiji Electricity Authority draft Power Development Plan Electricity Act (Cap.180) Clean Development Mechanism Policy Guideline 2010
Key assumptions on Mitigation	The key assumption is that finance can be obtained for mitigation in the power sector and assistance with energy efficiency improvements economy wide.

3.0 Key challenges and Proposed Way Forward, Action and Time bound Indicators to achieve Fiji's Emission Reduction Target

Key Challenges	Proposed Way Forward, Actions and Time bound Indicators
There is a need to reduce dependence on imported fossil fuel as a source of energy for electricity generation.	**Short Term (up to 2 years)** • Investment into more renewable energy projects which are feasible in Fiji such as solar (stand alone, solar farm, photovoltaic grid connected), biofuel, wind, micro hydro projects and biogas power generation (agricultural wastes). • Continued research and development in the area of new renewable energy technologies, including further exploration of ocean energy, geothermal energy, wave energy and generation of energy from waste. • Explore whether use of renewable energy could be considered a part of the approval process for new investments. **Medium Term (3 to 5 years)** • Promote and improve guidelines and technical standards for renewable energy technologies **Long Term (over 5 years)** • Continue research and development for energy from possible hydro carbon resources and hydrogen fuel cells. • Renewable energy share in electricity to be around 99% by 2030 from the 61% in 2013.

4.0 Mitigation

Energy in Fiji is supplied in three main forms: i) biomass/wood for cooking in rural areas and to a lesser extent for power co-generation in the wood and sugar industries; ii) as imported fossil fuels and iii) as electricity, of which a significant share is generated from hydropower with much smaller contributions from wind and solar energy.

4.1 Electricity

Fiji has many opportunities that have been identified for transferring most, if not all, of its electricity generation to renewable options. In this regard the relatively high installed capacity of hydro of around 120MW presents itself as a large scale storage facility for intermittent renewable inputs to be fed to the main grid. Wind has been trialled at the Butoni site in Sigatoka with mixed results. Large-scale biomass production is also an important option that is part of the mix from the Fiji Sugar Corporation (FSC) and timber producers. In addition small scale biomass is a distinct possibility. Geothermal has been identified as early as the 1960s but due to the relatively small nominal capacity of individual sites this technology has not progressed to large scale implementation maybe incompatible with the timescale presented by climate change. In addition, other sources such as wave and ocean energy and geothermal energy have also been investigated over the past decades but are not close to implementation.

It is clear that large-scale hydro in Fiji has been very successful and that the technology has been transferred relatively easily and implemented with considerable competence by the Fiji Electricity Authority (FEA). In recent years, the Monasavu system has been added to with another relatively large system at Nadarivatu. Unfortunately solar PV does not have as good capacity factor as hydro and so for a comparable kwh output around 5 times the installed capacity needs to be put in place. Nevertheless, solar PV is now becoming cheaper, almost by the month, and large-scale systems are now economically viable in most locations in the world with good solar regimes. In addition, such systems work best in conjunction with a fast switching stored generation option such as hydro schemes.

4.2 Energy efficiency

Energy efficiency has also been identified as a relatively low cost easily implemented option however, one that has not been seriously implemented in the country for various reasons including financial constraints. Energy efficiency will become more important as higher cost renewable resources are employed but, the law of physics always limits improvements, if they are unlikely to give the reductions needed for complete decarbonisation.

4.3 Transport

The addiction of modern society to individual transport options is common to Fiji and the country has been increasing its number of motor vehicles at around 5% pa from at least the 1970s. In addition, the engine size distribution is moving in the wrong direction for energy and emissions savings. Finally it is likely that the infrastructure that has been needed to accommodate such an increase in vehicle numbers has been a drain on national resources that is now locking in development to this transport mode. This path makes mitigation in this area difficult and more or less constrained to fuel switching (either biofuels or electricity) rather than mode changing for instance to improved public transport systems.

5.0 Adaptation

Fiji is in the front line of climate change. Increased droughts, floods and extreme events such as cyclones affect every sector of Fiji's economy and impact employment levels, the availability of natural resources and resilience. The goal of the objective of Adaptation of Fiji's National Climate Change Policy is to reduce the vulnerability and enhance the resilience of Fiji's communities to the impacts of climate change and disasters and as such, Fiji is proactively creating and refining policies, institutions and budgetary systems that can mobilize resources toward climate change and disaster risk management activities.

Some progress has already been made towards building resilience Government has commenced with the conducting of Vulnerability and Adaptation assessments for the whole of Fiji, invested in improving early warning systems, dredging of river mouths, construction of inland retention dams and the construction of cyclone proof homes in the most affected areas. Rehabilitation plans are focused on the principle of "building back better" especially for rural housing and infrastructure such as roads, water and energy. In the agriculture and forestry sector, the planting of traditional tree and root crops is being undertaken to minimize soil erosion and land degradation and desertification. The planting of mangroves, construction of seawalls and the relocation of communities to higher grounds are part of ongoing adaptation initiatives.

5.1 Key challenges and Proposed Way Forward, Action and Time bound Indicators for Adaptation[4]

Key Challenges	Proposed Way Forward, Actions and Time bound Indicators
There is a need to develop an integrated approach and policy and operational level to effectively address climate change.	**Short Term (up to 2 years)** • Establish a National Platform for Climate Change and Disaster Risk Management by 2015. • Develop a National Strategic Plan for Climate Change and Disaster Resilience by 2015. • Review the Fiji National Disaster Management Arrangements to include Climate Change by 2016.
There is a need to ensure that buildings constructed in urban and rural areas are cyclone resistant.	**Short Term (up to 2 years)** • Review the National Building Code by end of 2016. **Medium Term (3 to 5 years)** • Provide incentives to support compliance with new building standards by 2017.
There is a need to strengthen the role of local governments in building resilience.	**Short Term (up to 2 years)** • Development of a Local Government Self-Assessment Tool for Climate Change Resilience by 2016. • Review the town plan regulations to facilitate the enforcement of zoning and buffer zones for coastal areas, rivers banks, high risk areas and mangrove areas. Review to be completed by 2016.
There is a need for greater understanding of the impacts of climate change in order to better plan for long term development.	**Short Term (up to 2 years)** • Develop a comprehensive assessment framework, including adoption of the damage and loss assessment methodology by 2015. **Medium Term (3 to 5 years)** • Institutionalise a mechanism to collect and analyse hazard, vulnerability and exposure data by 2017. • Mainstream cost-benefit analysis into decision making process in mitigation and preparedness measures by 2017. • Encourage collaboration with development partners and tertiary institutions in conducting research on priority areas with climate change and disaster risk reduction by 2017. **Long Term (over 5 years)** • Develop hazard maps and models for all potential hazards (including sea level rise, storm surge, flood and tsunami) by 2020.
There is a need to ensure climate change mitigation and adaptation become a part of the national and sub national development planning and budgetary process.	**Short Term (up to 2 years)** • Integrate the climate change and disaster risk reduction into the National Development Plan by 2015. • Revise capital budget appraisal guidelines to incorporate comprehensive hazard and risk management (CHARM) and vulnerability and adaptation (VA) assessments by 2015.
There is a need to increase the resourcing of adaptation and	**Short Term (up to 2 years)** • Explore climate change financing modalities by 2015.

[4] A Green Growth Framework for Fiji

mitigation measures.	**Medium Term (3 to 5 years)** • Improve access to global financing facilities such as the Global Green Fund.
There is a need to strengthen partnerships at all levels for building resilience for climate change.	**Short Term (up to 2 years)** • Partner with civil society in undertaking capacity building at divisional and community level on building resilience, including through incentivising performers/performance. **Medium Term (3 to 5 years)** • Undertake vulnerability assessment for all communities by 2019. • Develop climate and disaster resilience plans for urban and rural communities (prioritising squatter settlements and other vulnerable communities) by 2019. **Long Term (over 5 years)** • Capacity building provided to communities for which vulnerability assessments have indicated that relocation is the long term adaptation strategy to minimise risks due to anticipated impacts of climate change.

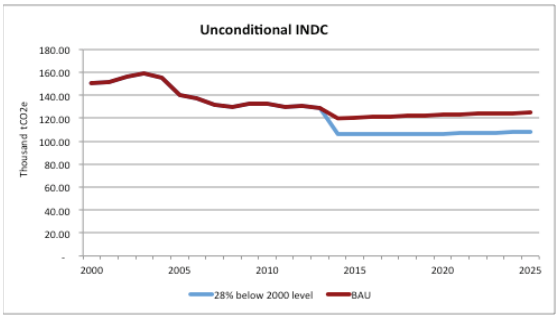
Federated States of Micronesia
Intended Nationally Determined Contribution

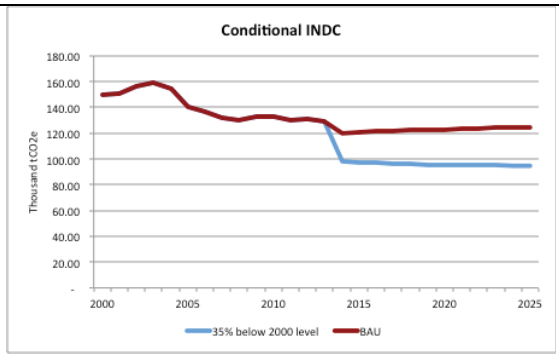
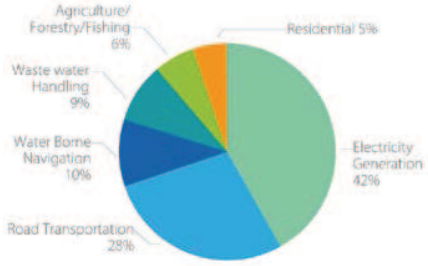
Type of INDC	*The Federated States of Micronesia (FSM) commits to reduce GHGs emission in percentage terms on a base year target.*

The INDC

Unconditional	The FSM commits to unconditionally reduce by 2025 a 28% its GHGs emissions below emissions in year 2000.
Conditional	Similarly, subject to the availability of additional financial, technical and capacity building support from the international community, the FSM could do by 2025 an additional reduction up to 35% below emissions in the 2000 base year.

Information to facilitate clarity, transparency and understanding

Type	Sectoral targets
Reference year or period	• Total GHG emissions for year 2000 in FSM were 150,000 tCO2e. • Emission reductions expected from the unconditional INDC are expected to be 28% below emissions in year 2000, at a level of 108,000 tCO2e approximately, as it is shown in the graph below:  • Emission reductions expected from the conditional INDC are expected to be 35% below emissions in year 2000 projections, at a level of 94,000 tCO2e approximately.

	
Target year	2025
Scope and coverage Gases	Carbon dioxide (CO_2),
Sectors	Energy sector: electricity generation and transport subsectors.
Percentage of total greenhouse gas emissions covered	Relative to the year 2000 inventory, electricity generation accounts for 42% of the total CO2e emissions, accounting for 64,000 tCO2e; meanwhile transport accounts for 38% of total CO2e emissions, accounting for 57,000 tCO2e, as it is shown in the figure below:  Thus, the INDC covers 80% of FSM's GHGs emissions.

General information

Planning processes

This INDC was developed through a stakeholder consultation process involving representatives of the National Government, the four FSM State Governments, Agencies and representatives from the private sector, civil society and non-government organizations. It builds upon existing renewable energy and transport targets and policies.

Assumptions and methodological approaches

GWPs used	Global Warming Potential on a 100 year timescale in accordance with the IPCCs 4th Assessment Report.
Inventory methodology	The FSM GHG inventory for year 2000 contained in the Second National Communication utilized the revised 1996 IPCC Guidelines.
Land sector emissions	N/A
International market mechanisms	FSM does not intend to use international market mechanisms.
Baseline	BAU scenarios for the electricity generation and transport sub-sectors were developed using the tool 'Long-range Energy Alternative Planning System' (LEAP). The following data was used in the LEAP model: Current electricity rate: International Renewable Energy Agency (IRENA) Report (2011) Historical electricity use: • 1998 data from the 1999 National Energy Policy of FSM • 2011 kWh sectoral data from Pacific Power Association 2012 • 2010-2013 kWh sectoral sales data calculated from Yap 2012 and 2013 YSPC Annual Report • 2009 kWh sectoral sales data calculated from the 2009 KUA Annual Report
Mitigation effects	Individual assumptions were made for the mitigation scenarios. These can be found in the technical report 'Electricity Sector Analysis for Federated States of Micronesia's Intended Nationally Determined Contribution' prepared by NREL.

Fairness and Ambition

FSM's contribution to climate change has always been marginal. Decision 1/CP.20 paragraph 11 provides the flexibility to SIDS to communicate information on strategies, plans and actions for low greenhouse gas emission development reflecting their special circumstances in the context of intended nationally determined contributions. In this context, the present INDC by FSM is ambitious due to the percentage type considered.

Moreover, national efforts to implement INDC in FSM imply that resources to be allocated for development priorities will be arbitrated to take into account the requirements of the implementation of the Paris Agreement.

By presenting an ambitious INDC in the context of the Paris' agreement, FSM would like to stress that the very survival of many SIDS is at stake without ambitious global emissions reductions that will ensure the stabilisation of the

greenhouse gas emission, ensuring we are on track toward limitation of global temperature rise below 1.5 degree Celsius by 2100.

Priority and needs related to adaptation

As for all SIDS, adaptation constitutes a priority for FSM. It is therefore important that the Paris Agreement deals effectively with the adaptation needs in a post 2020 world.

FSM does not see this INDC as the vehicle to address its adaptation needs in the post 2020 context, even if these need careful consideration and assessment. Such assessments are being made in the context of the Nation Wide Integrated Disaster Risk Management and Climate Change Policy 2013 and the FSM Climate Change Act 2014, as well as the joint state action plans for disaster risk management and climate change adaptation. All necessary efforts are being made to engage the country in the formulation and implementation of transformational adaptation investment plans to protect the country against climate change, through various sources of funding including from the UNFCCC financial mechanisms, the Green Climate Fund in particular.

Assumptions and conditions for implementation

- *Financial needs:*

Much will be needed for the implementation of FSM's INDC. An assessment of the implementation options is needed as soon as possible to ensure implementation no later than 2018. Potential sources will include the financial mechanisms of the Convention, other non-Convention financial and investments sources, as well as international, national and other financial sources. All these will be facilitated and enabled by public policy and regulatory frameworks.

- *Technical requirements:*

There is a need to design a national inventory system and to develop a framework for domestic Monitoring Reporting and Verification (MRV) of GHG emissions. There is a further need to access expertise and develop capacities to conduct such a process at the national and state levels.

- *Capacity building needs:*

There is a need to enhance the local capacity to plan, design, implement, manage, operate and maintain installed energy technologies. Similarly, human, technical and institutional capacity development is required in the following areas: GHG inventory, baseline scenario development, emissions projection, vulnerability

assessment, adaptation needs evaluation and prioritisation, climate finance access, mobilisation and disbursement.

- *Technology needs:*

  Specifically to implement the INDC in the energy sector, locally appropriate technology and equipment (resilient to the elements and extreme events) needs to be assessed and procured.

Any relevant additional information

FSM's INDC has been developed with the joint collaboration of the National Renewable Energy Laboratory (NREL) of the United States Department of Energy and Climate Analytics as implementing agency of the INDC Global Support Project by Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, financed by the Government of Germany Ministry for the Environment, Nature Conservation, Building and Nuclear Safety.

REPUBLIC OF KIRIBATI

INTENDED NATIONALLY DETERMINED CONTRIBUTION

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INTRODUCTION

The Republic of Kiribati is recognized as a Least Developed Country (LDC) and is ranked 170th of 186 countries on per capita GDP. Comprising 33 atolls and reef islands, the country is dispersed over 3.5 million square kilometres, giving rise to logistical issues in a country with unreliable connections. Kiribati's contribution to global warming is insignificant with emissions per capita (approximately 0.6tCO_2e/capita in 2014) among the lowest in the world. The only major sector of emissions for Kiribati is energy (including transport), with slight contributions from agriculture and forestry.

The country is one of the most vulnerable countries to the adverse impacts of climate change. Inundation and erosion are frequent impacts of climate change destroying key areas of land - storm surges and wave-overtopping contaminate the fresh groundwater lens which is vital for the population's water security. An economic evaluation of the costs of climate change related risks has been estimated to be 35% of Kiribati GDP. The estimate takes into account only the potential impacts of climate change on coastal zone (US$7-$13 million a year) and water resources (US$1-$3 million a year).

In order to build island resilience to the adverse impacts and extreme events of climate change and in parallel with achieving the common development goals of Kiribati, the country relies mostly on external aid (donors) to finance its adaptation measures towards CC as the country is unable to meet the costs of adaptation on its own. Kiribati has received external assistance to formulate its *Kiribati Joint Implementation Plan on Climate Change and Disaster Risk Management* (KJIP) (2014) (comparable to NAPA required under UNFCCC) which defines priority adaptation measures to address current and ongoing risks from climate change. Similarly, the Kiribati Adaptation Project III (KAP), initiated by the World Bank, is currently on-going. The need for Kiribati to build national capacity to facilitate direct access to climate change adaptation financing is a high priority in the immediate future.

In regards to mitigation, Kiribati has no obligation under the UNFCCC to reduce its emissions of greenhouse gases. Nonetheless, there have been significant efforts to date to reduce fossil fuel imports and increase domestic renewable energy use. These efforts include setting up of the Kiribati Solar Energy Company which provides solar lighting on rural islands and markets solar appliances; trialling of coconut oil based bio-fuel; and on-grid solar PV on urban islands.

Situation Analysis

The revenue of Kiribati is drawn primarily from five main sources: (i) the sale of fishing licenses (access fees account for more than 50% of annual government revenue and add about 22% to the GDP); (ii) official development assistance; (iii) The Kiribati Revenue Equalization Reserve Fund (RERF); (iv) general taxation; and, (v) tariffs paid by households for services. A high dependency on donor contributions and a vulnerability to external economic and environmental factors add to the challenges faced by the country, and more specifically the infrastructure sector.

Thus public sector dominates the economy, accounting for more than half of estimated gross domestic product (GDP). The general level of demand is largely determined by the government's recurrent budget, half of which is funded by access license fees paid by foreign fishing vessels to catch tuna in Kiribati's exclusive economic zones and by earnings of Kiribati's reserve fund invested in overseas financial markets. Total demand draws in close to $100 million of imports yearly, while yearly exports of goods are valued at around $5 million. The balance of payments current account is sustained by factor income from abroad (i.e., tuna vessel fishing licenses, seafarers‟ remittances, and investment earnings) and grants received by government, churches, and other non-government organizations.

Issues and challenges

As an atoll country, Kiribati is almost entirely dependent upon imported food and fuel. Subsistence farming and fishing are the primary economic activities. Some 18% of the population is in permanent employment, and over half of these work for the government. Approximately 47% of the population lives in South Tarawa, and this is a magnet for internal migration from the outer islands. South Tarawa provides opportunities for cash employment and consumption as well as access to higher education and specialist social services not available elsewhere in Kiribati. This has led to population growth of 5.2% in recent years into both North and South Tarawa. A UNDP study of poverty in Kiribati showed the highest incidence of basic needs poverty occurred in South Tarawa, affecting 18.3% of households and 24.2% of the population.

A whole-of-nation approach is being pursued by government to address the impacts of climate change and sea level rise and related environmental issues in Kiribati. The effects of climate change are seen as major challenge against developmental efforts which will require capacity building at all levels to manage and improve environmental, social and economic sustainability. Government is responsible for providing a platform on which to promote and raise awareness of climate change and sea level rise issues through a single coordinated body – Office of the Beretitenti (President) through Policy Coordination and Strategic Risk Management Division. The latter is responsible for governance, policy coordination among relevant sectors including non-government organisations, vulnerability and risk management, capacity-building, awareness and media coordination, and coordination of national positions on international issues relating to the various multilateral environmental agreements including the UN Frameworks Convention on Climate Change.

As one of the most vulnerable countries in the world to the effects of climate change its ability to respond to climate risks is hampered by its highly vulnerable socio-economic and geographical situation. Low atolls, isolated location, small land area separated by vast oceans, high population concentration, and the costs of providing basic services make Kiribati, like all Small Island Developing States (SIDS), especially vulnerable to external shocks including the adverse impacts of climate change. Sea-level rise and exacerbated natural disasters such as drought and weather fluctuations pose significant and direct additional threats to sectors and resources central to human and national development. The country is located in relatively calm latitudes but its low atolls (in many places no more than 2m above mean sea level and only a few hundred meters wide) are subject to long-term sea level rise and, more immediately, are exposed to continuing coastal erosion and inundation during spring tides, storm surges and strong winds. The islands are subject to periodic storm surges with a return period of 14 years. By 2050, 18-80% of the land in Buariki, North Tarawa, and up to 50% of the land in Bikenibeu, South Tarawa could become inundated. Because of narrow islands, the entire population and most infrastructure is concentrated along the coast making it directly exposed to these climatic

threats. The results of sea level rise and increasing storm surge threaten the very existence and livelihoods of large segments of the population, increase the incidences of water-borne and vector-borne diseases undermining water and food security and the livelihoods and basic needs of the population, while also causing incremental damage to buildings and infrastructure. The *Climate Change in the Pacific Report* (2011) describes Kiribati as having a low risk of cyclones. However, in March 2015 Kiribati experienced flooding and destruction of seawalls and coastal infrastructure as the result of Cyclone Pam, a Category 5 cyclone that devastated Vanuatu. Thus Kiribati remains exposed to the risk that cyclones will strip the low lying islands of their vegetation and soil.

MITIGATION

INFORMATION ON INTENDED NATIONALLY DETERMINED CONTRIBUTION	
PARTY: Republic of Kiribati	**DATE: August 2015**
Parameter	**Information**
Period for defining actions	Five year periods. Starting 2020, with reference to 2025 and ending in 2030
Type and level of Commitment	All commitments are premised on: (a) a fair and ambitious agreement being reached, reflecting Common but Differentiated Responsibilities and Respective Capabilities; and (b) timely access to international climate change financing, capacity building and technology. Kiribati is a LDC SIDS with limited resources, that will nonetheless commit to reduce emissions by: **13.7% by 2025** and **12.8% by 2030** compared to a BaU projection. In addition to these quantified outcomes, Kiribati will proactively protect and sustainably manage its mangrove resources, as well as protect and enhance coastal vegetation and seagrass beds. Together these actions represent effective stewardship of more than 6 million tonnes of Carbon Dioxide stored, more than 100 times the current annual national emissions inventory. On the understanding that a global agreement addresses international assistance to access financial and technical resources, Kiribati can, with international assistance, contribute a further: > 48.8% reduction in greenhouse gas emissions by 2025; and > 49% reduction in greenhouse gas emissions by 2030, compared to the BaU projection. **With appropriate international assistance, Kiribati can reduce its emissions by more than 60% (61.8%) by 2030.**
Reference year or period	The BaU projection is based on an extrapolation of historic data covering the period 2000-2014.
Estimated, quantified emissions impact	In addition to the carbon storage in the ocean ecosystem, Kiribati's unconditional contribution will reduce emissions by 10,090tCO_2e annually throughout the period 2020 to 2030. Kiribati's conditional contribution (with international assistance) will reduce emissions by 35,880tCO_2e annually by 2025, and by 38,420tCO_2e annually by 2030.

INFORMATION ON INTENDED NATIONALLY DETERMINED CONTRIBUTION		
PARTY: Republic of Kiribati		**DATE: August 2015**
Parameter		**Information**
Coverage	% of National emissions	INDC covers fossil fuels and marine sequestration. Fossil fuel use covers more than 98% of the reported national inventory
	Sectors	Energy sector: Power (approximately 48%) Transport (52%) Maritime and coastal sector including mangrove, coastal vegetation and seagrass beds.
	Gases	Carbon dioxide only (estimated > 99% of inventory)
	Geographical boundaries	Whole of country
Further information, relevant to commitment type		Commitments are in the form of Outcomes and Actions. These are referenced as deviation from Business as Usual projections. BaU projections are based on fossil fuel consumption data for the period 2000-2014, with line of best fit extrapolation to 2030. The projection will be revised to include more accurate information with the Third National Communication.
Intention to use market based mechanisms to meet commitments		Kiribati will consider market based mechanisms to support establishment and operation of a National Climate Change Trust Fund.
Land sector accounting approach		NA for Land Use. Appropriate methodologies drawn from international best practice to quantify sequestration from mangrove plantations.
Estimated macro-economic impact and marginal cost of abatement		TBD
Narrative supporting the fair-share assessment of the contribution		Kiribati is a LDC SIDS that is in no way responsible for the unfolding climate change catastrophe, yet Kiribati is extremely vulnerable to climate change impacts. Current (2014) greenhouse gas emissions from Kiribati are approximately 63,000tCO_2e/year. This is extremely small: representing approximately just 0.0002% of global emissions. Kiribati also has very low per capita emissions, at just: 0.6tCO_2 per person in 2014. This is less than the average per capita emissions of sub-Saharan Africa (0.8tCO_2/capita), and less than half of the estimated level required to stay below 2^{o}C of warming, of around 1.5tCO_2e/capita[1].

[1] Using 2010 data from World Bank, http://databank.worldbank.org/data/home.aspx.

INFORMATION ON INTENDED NATIONALLY DETERMINED CONTRIBUTION	
PARTY: Republic of Kiribati	**DATE: August 2015**
Parameter	**Information**
	Accordingly, ANY contribution from Kiribati is more than fair, and must be considered ambitious, given the extraordinary circumstances of Kiribati.

Mitigation Status and Context:

Greenhouse gas emissions are the result of combustion of imported fossil fuels in the energy sector for:

- Electricity generation;
- Sea transport;
- Land transport;
- Kerosene for lighting on outer islands; and
- LPG and kerosene for cooking.

The vision for the Kiribati National Energy Policy (KNEP) is "available, accessible, reliable, affordable, clean and sustainable energy options for the enhancement of economic growth and improvement of livelihoods in Kiribati." Reducing fossil fuel imports is the major goal, with the uptake of renewable energy along with further energy efficiency improvements on both the demand and supply sides, expected to replace more than one-third of fossil fuels for electricity and transport by 2025.

Reflecting the ambition of the Majuro Declaration[2], Kiribati has identified targets focused on reductions in fossil fuel use by 2025 through increases in renewable energy and energy efficiency (RE and EE) in the following sectors and geographical areas:

- South Tarawa by 45% (23% RE and 22% EE);
- Kiritimati Island by 60% (40% RE and 20% EE);
- rural public infrastructure, including Southern Kiribati Hospital and Ice plants by 60% (40% RE and 20% EE); and
- rural public and private institutions such as boarding schools, Island Council, private amenities and households by 100%(100% RE).

Actions

In preparing its INDC, Kiribati considered mitigation actions that were currently planned and funded (as the Kiribati Contribution), and those that have been identified as technically viable with current technology suitable to the Kiribati context (as the Contribution conditional on adequate and timely international assistance), summarised in the Table below.

[2] 'Majuro Declaration for Climate Leadership' 2013. Pacific Islands Forum Leaders' Meeting, Majuro, Republic of Marshall Islands.

Sector	Mitigation option	INDC type	Mitigation in 2025 (tCO_2e)	% of 2025 projected inventory	Mitigation in 2030 (tCO_2e)	% of 2030 projected inventory
	Mitigation options using Kiribati and current international assistance					
Energy	1.3MW PV on-grid in South Tarawa	Kiribati	1910	2.6	1910	2.4
Energy	Outer Island and rural electrification (off-grid solar)	Kiribati	1100	1.5	1100	1.4
Ocean	Mangrove forest enhancement	Kiribati	7,080	9.6	7,080	9.0
		Total:	10,090	13.7	10,090	12.8
	Mitigation options requiring new and additional climate finance and technical assistance					
Energy	Maximum use of RE & EE	Conditional on assistance	12,050	16.4	13,030	16.6
Energy	Use of coconut oil as biodiesel for electricity generation	Conditional on assistance	12,050	16.4	12,840	16.4
Energy	Use of coconut oil as biodiesel for transport	Conditional on assistance	11,780	16.0	12,550	16.0
		Total:	35,880	48.8	38,420	49.0

To be realised, the conditional mitigation Actions require a timely combination of capacity building, technology transfer, and financial support, primarily in the form of grants. Additional mitigation actions may be identified in the future.

Below is a brief summary of the activities proposed for off-grid electricity production, with estimates of financial resources required (in AUD):

- Activity 1 – Solar PV mini grid system for Southern Kiribati Hospital (2.4 million) - design, procure and install off-grid PV systems for the Southern main hospital (265kWp) to a level to support the fully equipped needs to operate the hospital. (not yet fully funded)

- Activity 2 – Outer Island Clinic solar system rehabilitation ($230,000.00) - design, procure, and install 58 systems in total on 20 outer Islands to provide power for lighting and for HF communication radio. (not yet fully funded)

- Activity 3 – Mereang Taabwai Secondary Schools solar PV mini-grid ($500,000.00) - design, procure and install off-grid PV systems (20 kWp) for the school to a level to

support a fully equipped computer lab, dormitory lighting, refrigerator/freezers, office equipment and audio-visual equipment. (funded/under implementation)

- Activity 4 –Junior Secondary School (JSS)system.($285,000.00) - design, procure and install off-grid PV systems for lighting and Charging Laptop computers of 2 classrooms and staff room in all JSS in the Outer Islands (410 Wp each). (not yet fully funded)

- Activity 5 –Solar Home System for Households.(1.5million) - procure and install 3900 solar home system to cover up all remaining households in the Outer Islands. The system will provide basic lighting, phone and radio charging which will improve social-economic condition in the Outer Islands. (funded/under implementation)

- Activity 6 – Outer Island Council solar PV mini grid system ($710,000.00) - design, procure and install off-grid PV systems (5 kWp each) for island council administrative centres in the Gilbert and Line Groups. (not yet fully funded)

- Activity 7 – Outer Island Fish Centres ($610,000.00) - design, procure and install off-grid PV systems for the Fish Centres (3.75kWp each) in all the Islands to a level to support a fully equipped centres lighting, refrigeration and other equipment. (not yet fully funded)

- Activity 8 – Desalination Plant for vulnerable rural community. ($115,000.00) – 19 systems for 12 community systems for solar water desalination plant will be procured and installed on 9 selected Islands. This activity will improve quality of life in households by providing portable water supply to the most vulnerable Islands in Kiribati. (not yet fully funded)

- Activity 9 – Outer Island Police Station solar system rehabilitation ($60,000.00) - 23 solar systems (120 Wp each) will be procured and installed in all of the outer Islands for communication, lighting, etc at the Police stations and an additional 8 Police posts. (not yet fully funded)

- Activity 10 – Solar PV system for non-government vocational institutions: CCL Manoku and Alfred Sadd Institution ($500,000.00) - design, procure and install off-grid PV systems (10 kWp) for each community institution to support the institution daily activities. (funded/under implementation)

ADAPTATION

Kiribati has been working actively on climate change adaptation for 20 years, and with the development of pioneering tools and methodologies that are regarded as best practices regionally and internationally, has made and continues to make a considerable contribution to the global and regional adaptation planning and management process and pool of knowledge on building climate resilience. This contribution is made in the face of severe constraints and challenges confronted by Kiribati as a small island developing States (SIDS) and Least Developed Country (LDC). For Kiribati, where climate change threatens the very existence of the nation and population, adaptation is not an option – but rather a matter of survival.

Current climate, projected climate change and related assumptions

Kiribati has a hot, humid, tropical climate with an average air temperature of 28.3°C and average rainfall of about 2100 mm per year in Tarawa (1980–1999). Its climate is closely related to the temperature of the oceans surrounding the small islands and atolls. Across Kiribati the average temperature is relatively constant year round. From season to season the temperature changes by no more than about 1°C. Kiribati has two seasons – te Au Maiaki, the dry season and te Au Meang, the wet season. The periods of the seasons vary from location to location and are strongly influenced by the seasonal movement of the South Pacific Convergence Zone (SPCZ) and the Inter-tropical Convergence Zone (ITCZ).

The six-month dry season (te Au Maiaki) for Tarawa starts in June, with the lowest mean rainfall in October. The wet season (te Au Meang) starts in November and lasts until April; the highest rainfall occurs from January to March, peaking with a mean of 268 mm in January. The highest rainfall usually occurs when the ITCZ is furthest south and closest to Tarawa; there are also high rainfalls, though to a lesser extent, when the SPCZ is strongest. The average sea-surface temperature of oceans around Kiribati is 29.2°C (1980–1999). As Kiritimati is 2000 km to the east from Tarawa, its wet season starts at a different time, from January to June, with the wettest months being March and April. Rainfall in the northeast of Kiribati is only affected by the ITCZ.

Across Kiribati there is a change in mean monthly rainfall towards the end of the year. There is however, a large variation in mean annual rainfall across Kiribati. A notable zone of lower rainfall, less than 1500 mm per year exists near the equator and extends eastwards from 170°E. On average, Tarawa at 1.1416ºN receives just under 2100 mm, while the island of Butaritari at 3.1678ºN only 350 km to the north, receives around 3000 mm. The climate of Kiribati, especially rainfall, is highly variable from year to year. Tarawa, for example, receives more than 4000 mm of rainfall in the wettest years, but only 150 mm in the driest. This huge range is similar in Kiritimati and has enormous impacts on water availability and quality, crop production, food security and health. The main reason for this variability is the El Niño–Southern Oscillation (ENSO). Many Kiribati islands lie within the equatorial waters that warm significantly during an El Niño event and cool during a La Niña event. As a result rainfall is much higher than normal during an El Niño and much lower during a La Niña. Maximum air temperatures tend to be higher than normal during El Niño years, driven by the warmer oceans surrounding the islands, while in the dry season minimum air temperatures in El Niño years are below normal. At Kiritimati, El Niño events also bring wetter conditions in both seasons and La Niña events bring drought. El Niño is generally associated with above-normal rainfall and strong westerly winds, while La Niña is associated with below-normal rainfall and the risk of drought.

The climate of Kiribati is changing and will continue to change in the future as a result of global climate change. Table 2 summarises the trends already observed in variables such as temperature, rainfall, sea level, extreme events and ocean acidification in Kiribati.

Table 2: Climate trends in Kiribati Observed over a period from 1950 to 2009

Climate Variable	Observed Trends
Air temperature	Annual and seasonal mean air temperatures are getting warmer: • Maximum temperatures have increased at a rate of 0.18°C per decade. • Annual and seasonal minimum air temperatures have increased slightly more than the increase in maximum air temperatures.
Sea-surface temperature	Water temperatures have risen since the 1970s: • in the Gilbert Group by approximately 0.15°C per decade; • in the Line Group by approximately 0.1°C per decade; and • in the Phoenix Group by approximately 0.12°C per decade. Since 1950 the rise has been gradual in the waters around the Gilbert Islands, but it has been variable from one decade to the next in the Line and Phoenix Islands.
Rainfall	Annual rainfall has increased: • Annual and wet season rainfall has increased for Kiritimati but there is no trend in the dry season. • At Tarawa, rainfall data show no clear trends. • At both the above sites, rainfall has varied substantially from year to year.
Droughts	The impact of droughts, usually associated with La Niña, can be severe in Kiribati; for example: • In 1971, 1985, 1998 and 1999 annual rainfall was less than 750mm. • The recent drought from April 2007 to early 2009 severely affected the southern Kiribati islands and Banaba. During this period, groundwater turned brackish and the leaves of most plants turned yellow.
Cyclones, severe storms and extreme sea levels	• Tropical cyclones rarely pass between the Kiribati islands. • Between 1969/70 and 2009/10 three cyclones passed within 400km of Arorae Island in western Kiribati and three cyclones within 400km of Caroline Island in eastern Kiribati. • Storm surges and extreme sea levels occur occasionally.
Sea level	Sea level has risen (see figure 6): • Sea level measured by satellite altimeters has risen by 1–4mm per year (global average is 3.2 +/– 0.4mm per year). • Sea-level rise naturally fluctuates from year to year at levels of about 26cm. There are also decade to decade variations. These fluctuations over both timeframes are a result of phenomena such as ENSO.
Ocean acidification	Ocean acidification has been increasing: • Since the 18th century ocean has been slowly becoming more acidic. The aragonite saturation state has declined from about 4.5 in the late 18th century to an observed value of about 3.9 ± 0.1 by 2000. • 'Based [on] the large-scale distribution of coral reefs across the Pacific and the seawater chemistry, Guinotte et al. (2003) suggested that seawater aragonite saturation states above 4 were optimal for coral growth and for the development of healthy reef ecosystems, with values from 3.5 to 4 adequate for coral growth, and values between 3 and 3.5, marginal. Coral reef ecosystems were not found at seawater aragonite saturation states below 3 and these conditions were classified as extremely marginal for supporting coral growth' (KMS, BoM & CSIRO 2011, Vol. 2, p.100).

With many islands situated at 2 meters or less above sea level, Kiribati has already witnessed first hand the impacts of global climate change. According to the Pacific Regional Environment Programme (SPREP), two small uninhabited Kiribati islets, Tebua Tarawa and Abanuea, disappeared underwater in 1999. The United Nations Intergovernmental Panel on Climate Change predicts that sea levels will continue to rise due to climate change, and it is thus likely

that within a century the nation's arable land will become subject to increased soil salination and will be largely submerged, while other islands and atolls will share a similar fate to Tebuatarawa and Abanuea and disappear altogether.

Table 3 provides climate change projections for Kiribati are based on up to 18 global climate models for up to three emission scenarios – low, medium and high – and three 20-year periods – centred on 2030, 2055 and 2090, relative to 1990. There is no single projected climate future for Kiribati, but rather a range of possible futures. Projections represent an average change over either the whole of Kiribati or over smaller but still broad geographic regions such as the Line Group. However, projections are not for specific locations such as towns. The projections listed in Table 3 are presented along with confidence levels based on expert judgement by scientists who conducted the analysis. The levels range from very high, high and moderate to low confidence.

Table 3: Climate projections for Kiribati over the 21st century

Climate Variable	Projected Changes
Air temperature	Surface air temperature will continue to increase (very high confidence). Under a high emission scenario (see also Table 4): • Annual and seasonal mean temperature will increase by 0.3–1.3°C for the Gilbert Islands and by 0.4–1.2°C for the Phoenix and Line Islands by 2030 (high confidence). • Annual temperature increases could be greater than 3°C by 2090 (moderate confidence). (As there is no consistency in projections of future ENSO activity, it is not possible to project Interannual variability in temperature.)
Sea-surface temperature	Sea-surface temperature will continue to increase (very high confidence): • Sea-surface temperatures will increase by 0.6–0.8°C by 2035 and by 1.2–2.7°C by 2100 (Bell et al. 2011). (As there is no consistency in projections of future ENSO activity, it is not possible to project Interannual variability in sea-surface temperature.)
Rainfall	Rainfall patterns will change: • Wet season, dry season and annual average rainfall will increase (high confidence). • Annual and seasonal mean rainfall will increase (>5%) by 2030. The majority of models simulate a large increase (>15%) by 2090 (low confidence).
Extremes	There will be more extreme rainfall and very hot days: • The intensity and frequency of days of extreme heat and warm nights will increase and Cooler weather will decline (very high confidence). • The intensity and frequency of days of extreme rainfall will increase (high confidence).
Drought	The incidence of drought will decrease (moderate confidence): • In the Gilbert, Phoenix and Line Islands mild drought will occur approximately seven to eight times every 20 years by 2030, decreasing to six to seven times by 2090 (low confidence). • The frequency of moderate drought is projected to decrease from two or three times every 20 years by 2030 to once or twice by 2090 (low confidence). • Severe drought will occur approximately once or twice every 20 years by 2030, decreasing to once every 20 years by 2055 and 2090 (low confidence).
Sea level	Mean sea level is projected to continue to rise (very high confidence): • Mean sea level will rise by approximately 5–15cm by 2030 and 20–60cm by 2090 under the higher emissions scenario (moderate confidence; see Table 5 and Figure 5). • Interannual variability of sea level will lead to periods of lower and higher regional sea levels with levels similar to the past. • The sea-level rise combined with natural year-to-year changes will increase the impact of storm surges and coastal flooding. (Scientists warn that due to the melting of large ice sheets such as those in Antarctica and Greenland, rise could possibly be larger than predicted. But currently not enough is known to make predictions confidently.)
Ocean	The acidification of the ocean will continue to increase (very high confidence):

acidification	• The annual maximum aragonite saturation state will reach values below 3.5 by about 2045 in the Gilbert Islands, by about 2030 in the Line Islands, and by about 2055 in the Phoenix Islands. The aragonite saturation will continue to decline thereafter (moderate confidence). • Ocean pH will decrease by –0.1 units by 2035 and by –0.2 to –0.3 units by 2100 (Bell et al. 2011). • Coral reefs are projected to degrade progressively with losses of live coral of > 25% by 2035 and > 50% by 2050 due to rising sea-surface temperatures and more acidic oceans (Bell et al. 2011).

Past La Niña events have shown that the impacts of droughts can be very severe in Kiribati. For example, in 1971, 1985, 1998 and 1999, annual rainfall was less than 750 mm. The recent drought from April 2007 to early 2009 severely affected the southern Kiribati islands and Banaba. During this period, copra production significantly declined, depressing the outer island economies which rely on copra as a main income source. The groundwater also turned brackish and the leaves of most plants turned yellow. During the 1970–1971 drought, a complete loss of coconut palms was reported at Kenna village on Abemama in central Kiribati.

The country is located in relatively calm latitudes but its low atolls (in many places no more than 2m above mean sea level and only a few hundred meters wide) are subject to long-term sea level rise and, more immediately, are exposed to continuing coastal erosion and inundation during spring tides, storm surges and strong winds. The islands are subject to periodic storm surges with a return period of 14 years. By 2050, 18-80% of the land in Buariki, North Tarawa, and up to 50% of the land in Bikenibeu, South Tarawa could become inundated. As a result of ENSO events, Tarawa already experiences significant natural fluctuations in sea level of about 0.5 metres. These fluctuations will affect the inundation potential of the atoll, particularly when combined with storm surges and the projected increase in sea level. The low-lying places along the atolls have already experienced coastal inundation from unexpected extreme high tides. The extreme high tides, when they coincide with the spring tide, result in a threshold of >2.8 metres, as in 2010 when wave overtopping damaged infrastructure and properties. Because of narrow islands, the entire population and most infrastructure and agricultural production is concentrated along the coast making it directly exposed to these climatic threats. The results of sea level rise and increasing storm surge threaten the very existence and livelihoods of large segments of the population, increase the incidences of water-borne and vector-borne diseases undermining water and food security and the livelihoods and basic needs of the population, while also causing incremental damage to buildings and infrastructure.

Analysis of vulnerable sectors and segments of society

Kiribati is one of the most vulnerable countries in the world to the effects of climate change. The country's ability to respond to climate risks is hampered by its highly vulnerable socio-economic and geographical situation. Low atolls, isolated location, small land area separated by vast oceans, high population concentration, and the costs of providing basic services make Kiribati, like all Small Island Developing States (SIDS), especially vulnerable to external shocks including the adverse impacts of climate change. Sea-level rise and exacerbated natural disasters such as drought and weather fluctuations pose significant and direct additional threats to sectors and resources central to human and national development and the provision of basic human needs.

The following factors are contributing to the nation's vulnerability to climate change and disaster risks, which apply across the various sectors:

- A high population and growth rate on South Tarawa in the Gilbert Group (50,182 inhabitants with a population density of 3,184 persons per square kilometer) as well as on Kiritimati in the Line Islands Group (5,586 inhabitants), which is due to: a high proportion of children and youth, high levels of fertility, low rates of contraceptive use, and disparities between the different islands of Kiribati (resulting in internal migration, displacement, and urbanisation), all effecting the resilience of the population and natural ecosystems;
- In fast-growing urban areas, especially South Tarawa with a growth rate of 4.4% and to a certain extent also North Tarawa and Kiritimati, the population pressure and lifestyle changes have strained the already limited freshwater resources - in many areas, the freshwater consumption rates are already exceeding the estimated sustainable yield of groundwater sources (such as in the Bonriki and Buota Water Reserves on South Tarawa);
- The increase in non-biodegradable waste usage in urban areas, as well as poor waste and sanitation management, result in limited access to unpolluted land and sea, degradation of land and ocean based ecosystems, and numerous isolated occurrences of diarrhoeal and vector borne diseases, all affecting the resilience of the population and natural ecosystems;
- Traditional food systems are declining in favour of imported food, and the number of people who preserve and apply traditional knowledge is decreasing, affecting food security;
- In rural outer islands, the people have limited access to employment opportunities, effective transport, communication, and community services such as education and health - these factors, combined with a high dependency on subsistence agriculture and coastal fisheries, make rural communities more vulnerable;
- Government revenue is declining and highly dependent on fisheries revenue (40–50%) with limited capacity to maximise the benefits of these resources;
- Many laws do not take into account sustainable management concerns, climate change predictions and disaster risks;
- Safety and emergency response capacities of Kiribati are limited;
- The low-lying atoll islands are already experiencing severe coastal erosion and inundation due to natural and human causes, leading to a loss of land, public and private buildings, and infrastructure.

In the long-term, the most serious concern is that sea-level rise will threaten the very existence of Kiribati as a nation. But in the short to medium term, a number of other projected impacts are of immediate concern. Of particular note is the concern as to whether the water supply and food production systems can continue to meet the basic needs of the rapidly increasing population of Kiribati.

The effects of climate change are felt first and most acutely by vulnerable and marginalised populations, including women, children, youth, people with disabilities, minorities, the elderly and the urban poor. Violence against women and children is a widespread issue within Kiribati society, which can be exacerbated in times of disasters when normal social protection may be missing. In addition, the population is facing stress due to the uncertainty over their livelihood, culture and homeland. Climate variability, climate change and disaster risks, in combination with the factors that make Kiribati particularly vulnerable to them, are affecting the environment and all socio-economic sectors, including agriculture, education, fisheries, freshwater, health, infrastructure, trade and commerce.

Table 4: Summary of potential climate change impacts on populations, key sectors and ecosystems

Increase in air temperature (°C)	• Increased incidence of food-borne diseases • Increased incidence of heatstroke amongst labourers & vulnerable members of society • Increased incidence of fires • Reduced productivity of livestock due to heat stress • Increased cost for air conditioning and refrigeration affecting disposable incomes of population and operational costs of business
Increase in sea surface temperature (°C)	• Increased incidence of coral bleaching leading to loss of biodiversity and coastal defences; • Migration of coastal fishery affecting food security and livelihoods
Change in rainfall patterns and increased rainfall intensity	• Increased incidence of water-borne, vector-borne and food-borne diseases; • Increased threat to food production and food security; • Increased incidents of invasive species.
Increased incidence of extreme events (drought, storms)	• Increased threat to food production and food security; • Increased threat to water quality and availability affecting human health; • Increased economic costs for development, maintenance and insurance; • Increased disruption to marine transportation affecting supply of basic needs; • Disruption to delivery of essential services; • Loss of life.
Sea level rise compounded by storm surge	• Increased coastal inundation and coastal erosion resulting in loss of land; • Increased loss of coastal biodiversity; • Increased salinization of ground water lens resulting in reduced access to safe drinking water; • Damage to and loss of homes and critical infrastructure; • Increased economic costs for development, maintenance and insurance; • Loss of cultural and historic sites; • Increase in conflict and stress due to loss of property and land, and forced migration.
Ocean acidification	• Increased loss of coastal and marine biodiversity affecting livelihoods, household incomes and food security.

National Adaptation Efforts including International and Regional Support for Adaptation

The Kiribati government first became aware of climate change and sea level rise in the early 1990's, and requested scientific advice on whether there was any real cause for concern about sea level rise. The earliest studies could not provide information in that regard, but they were useful in making the Kiribati government more aware and knowledgeable about its geophysical environment and ecosystems, and sea level changes over the geological time span.

Subsequently but still during the early 1990s, more detailed studies were undertaken. A study area on a small island in Tarawa suggested certain areas to be liable to flooding from storm surges. This has been vindicated during storm surges in the 2000s. A study of Kiritimati island, which is the largest atoll in Kiribati and indeed in the world, indicated that the land had been rising. These studies, however, did not provide or take into account any sea level rise scenarios.

The US Country Study Programme, starting in 1995, was the first climate change project, and focussed on developing a country profile for Kiribati. Subsequently, the Kiribati *Initial National Communication* submitted to the UNFCCC in 2000 was one of the outputs of the Pacific Islands Climate Change Assistance Programme[3] to which Kiribati participated. Since the completion of the *Initial National Communication*, several studies and assessments have been undertaken by various international institutions on various vulnerable sectors relevant to climate change in Kiribati. These studies are important undertakings to highlight key vulnerabilities in Kiribati which require adaptive actions.

After PICCAP, funding for various enabling activities to be undertaken by LDCs was established in a decision of the UNFCCC, including the development of National Adaptation Plans of Action. Kiribati participated in the development of the NAPA and working with UNDP completed its NAPA document and submitted it to the UNFCCC in 2007. Concurrently with the preparation of the NAPA, Kiribati welcomed a World Bank initiative to start the Kiribati Adaptation Project (KAP) with co-finance from Government of Japan. The initial phase of KAP under the World Bank focussed on the preparation of Adaptation Project Implementation Plan for the second phase, and studies that were considered necessary to guide and inform a mulit-year program on adaptation.

The second phase of KAP, that is KAP II, was completed in 2011 with many technical assessments produced on the coastal vulnerability relative to sea level scenarios, droughts information, water planning, design of coastal protection leading to the construction of some coastal protection structures, rainwater harvesting and construction of a community infiltration gallery in North Tarawa, and other improvement works on South Tarawa water supply.

The Kiribati Adaptation Program-Phase III (KAP III) builds on KAP II best practices in designing and implementing adaptation measures in water and civil works. The Project is being implementing physical investments and capacity building; emphasize community consultation/participation; and leverage other donor activities in pursuing climate resilient investments. It is expected that the project will move quickly to the implementation of investments on the basis of the extensive technical and analytical work already carried out during the preparation and implementation phase of KAP II. KAP III activities represent both climate change adaptation and natural hazard disaster reduction measures. In particular,

[3] The PICCAP was executed through the South Pacific Regional Environment Programme (SPREP) with funding provided by the Global Environment Facility (GEF).

expansion of the ground water reserves is crucial to managing severe droughts which impose severe public health risks on Tarawa and require national emergency response. The proposed shoreline protection investments mitigate the effects of erosion of assets in the coastal zone, e.g. roads, and retain the width of water reserves to sustain freshwater lenses. KAP III main activities include: (i) improvements to water resource use and management with primary sub components of groundwater abstraction system; water reticulation including leakage detection; up-gradation of water supply at Tungaru Hospital; community awareness about water conservation; feasibility of developing treated water resources in South Tarawa; water legislations, etc. (ii) enhancement in costal resilience with primary emphasis on continuation of shoreline protection works in South Tarawa; and advisory support and asset management of coastal infrastructure; (iii) institutional strengthening; and (iv) project management.

Funds for these adaptation projects have been from a variety of bilateral and multi-lateral grants. The principal delivery mechanism for climate change adaptation programs in Kiribati has been through intermediary organisations such as the World Bank, UNDP, UNEP, various bilateral organisations, and regional agencies such as SPC and SPREP. Currently, Kiribati is working with the World Bank, UNDP and SPREP to prepare adaptation projects for funding under the Green Climate Funds and the Global Environment Facility (GEF).

Adaptation Policy and Programs - Nationally determined adaptation needs, options, adaptive capacity enhancement

A whole-of-nation approach is being pursued by government to address the impacts of climate change and sea level rise and related environmental issues in Kiribati. Climate change and disaster risks are being addressed in policies and strategies relating to population, water and sanitation, health and environment. Similarly disaster risk management is progressively being incorporated into policies and strategies relating to fisheries, agriculture, labour, youth and education. The new *Kiribati Integrated Environment Policy* encourages all government programs to collect, manage and use environmental data to safeguard the environment and strengthen resilience to climate change and disasters.

The *Kiribati Development Plan* (KDP) 2012–2015 is the overarching national development plan detailing national priorities. The KDP is linked to the Millennium Development Goals, the Pacific Plan and the Mauritius Strategy for Small Island Developing States (BPoA+10). The KDP has six broad key policy areas (KPAs). Climate change is incorporated into KPA 4 on environment, providing the link to the KJIP. The key objective of KPA 4 is to facilitate sustainable development by mitigating the effects of climate change through approaches that protect biodiversity and support the reduction of environmental degradation by the year 2015.

The *National Adaptation Program of Action* (NAPA) (2007) sets out a 3 year plan for urgent and immediate actions in the Republic of Kiribati to begin work in adapting to climate change. The goal of the NAPA was to contribute to and periodically complement a long term framework of adaptation through identifying immediate and urgent adaptation needs that are consistent with national development strategies and climate change adaptation policies and strategies. The objective is to communicate in a simplified way the identified immediate and urgent adaptation needs of Kiribati, which is also relevant to the national communication obligation required by the UNFCCC. These adaptation needs are identified through a participatory, consultative and multidisciplinary planning process. The NAPA outlines 9 priority projects valued at US$11.983 million to address short-term (3 years) needs in critical sectors (water, coastal zone

management, agriculture, coastal infrastructure) and to strengthen national adaptive capacity and information systems.

The *National Framework for Climate Change and Climate Change Adaptation* (April 2013) establishes a framework for an effective national response to address the impacts of climate change that requires that climate change and climate change adaptation assume a prominent role within the national development planning process. This process is comprised of five main parts that include long range policy and strategy statements, namely: Kiribati Development Plan (KDP), annual GoK Budget, multi-year budget framework and Ministry Operational Plans (MOPs) and Public Enterprise Business Plans (PEBPs). This document extends the 2005 *Climate Change Adaptation Strategy* which was developed as part of the World Bank funded Kiribati Adaptation Project. Under this strategy the following five headings outline Kiribati action to strengthen its capability to meet the challenge of climate change. These are:

- Mitigation - aim to improve energy efficiency and enhance the use of renewable energy both on the main islands and in the outer islands;
- Integration of climate change and climate change adaptation into national planning and institutional capacity – aim to integrate climate change adaptation considerations into Kiribati Development Plan (KDP), annual GoK Budget, multi-year budget framework and Ministry Operational Plans (MOPs) and Public Enterprise Business Plans (PEBPs);
- External financial and technical assistance - have international climate change funds channeled directly into the mainstream activities of line Ministries involved with climate change adaptation as direct budget support as a national priority;
- Population and resettlement – aim to reduce the vulnerability of Kiribati to increasing physical risks caused by climate change by establishing host country agreements to government-sponsored and self-sponsored emigration to resettle I-Kiribati overseas and assist the inevitable migration of the population, due to climate change as and when this eventually arrives;
- Governance and services – aim to improve policy coordination and planning on climate change adaptation, strengthen capacity of government to implement climate change adaptation measures, and build improves technical services capacity to address risks from climate change;
- Survivability and self-reliance – ensure that risks associated with climate change and the intellectual and practical processes for the planning for the consequence of climate change are undertaken at the earliest opportunity.

The *Kiribati Joint Implementation Plan on Climate Change and Disaster Risk Management* (KJIP) (2014) has been developed to reduce the vulnerabilities to the impacts of climate change and disaster risks and to coordinate priorities so that investments will derive maximum value. The KJIP is part of the commitments Kiribati made under the Pacific Islands Framework for Action on Climate Change (PIFACC), the Regional Framework for Action on Disaster Risk Management endorsed by the Pacific Leaders in 2005 and the Pacific Islands Meteorological Strategy (PIMS) approved in 2012. The KJIP is consistent with these three inter-related regional frameworks, specifically in terms of the national priorities for actions. As party to the United Nations Framework Convention on Climate Change (UNFCCC), the Government sees the KJIP as its National Action Plan on climate change. Similarly, the KJIP is contributing to the implementation of the Hyogo Framework for Action (2005–2015) under the United Nations International Strategy on Disaster Risk Management (UNISDR) and the Climate Services priorities of the World Meteorological Organisation (WMO). The vision of the 9-year KJIP (2014 – 2023) is:

I-Kiribati unique culture, heritage and identity are upheld and safeguarded through enhanced resilience and sustainable development.

The goal of the KJIP is to increase resilience through sustainable climate change adaptation and disaster risk reduction using a whole of country approach. To reduce vulnerabilities and respond to observed and likely impacts of climate change and disaster risks, the KJIP identifies 12 major strategies, as follows:

- Strengthening good governance, policies, strategies and legislation;
- Improving knowledge and information generation, management and sharing;
- Strengthening and greening the private sector, including small-scale business;
- Increasing water and food security with integrated and sector-specific approaches and promoting healthy and resilient ecosystems;
- Strengthening health-service delivery to address climate change impacts;
- Promoting sound and reliable infrastructure development and land management;
- Delivering appropriate education, training and awareness programmes;
- Increasing effectiveness and efficiency of early warnings and disaster and emergency management;
- Promoting the use of sustainable renewable sources of energy and energy efficiency;
- Strengthening capacity to access finance, monitor expenditures and maintain strong partnerships;
- Maintaining the sovereignty and unique identity of Kiribati;
- Enhancing the participation and resilience of vulnerable groups

Each strategy has one or more key actions, sub-actions, outcomes and performance indicators (outcome- and output-based) to address climate change and disaster risks in response to the identified vulnerabilities and impacts. Detailed strategic plan with key actions, sub-actions, results and performance indicators, lead and support agencies and partners associated with each strategy, are provided as an Annex to the KJIP. All strategies and actions in the KJIP are inclusive of vulnerable groups, considering gender, youth and children, the elderly and people with disabilities.

Adaptation Capacity, Including Engagement of Private Sector and Civil Society in Adaptation and Climate Resilience Building

The implementation of priority adaptation measures face serious institutional challenges such as a high staff turnover rates in senior executive positions, limited sector specific training, and a lack of clarity on internal roles and responsibilities. Furthermore, there are constraints on adaptation knowledge sharing, coordination and collaboration among ministries as well as with nongovernmental organisations (NGOs), the private sector, faith-based organisations and development partners.

There continues to exist knowledge, skill level and capacity gaps with regards to climate change adaptation and disaster risks throughout Kiribati society, particularly in the outer islands and among marginalised populations. A key challenge is to translate the climate science and predicted impacts into messages that the I-Kiribati population can relate to. In some instances there are cultural and religious barriers to awareness and action, such as cultural practices of guarding traditional knowledge and religious beliefs. There is very limited capacity at the

community level to undertake local level vulnerability mapping, adaptation planning and the implementation of priority adaptation interventions.

In 2007, Kiribati participated in a GEF-funded National Capacity Self Assessment (NCSA) to evaluate capacities for the implementation of the Rio Conventions, including the UNFCCC. A report on the thematic area of climate change was produced. The Report documents that the first climate change project undertaken by Kiribati government that focussed on capacity building was the US funded Climate Change In Country Studies. Key outputs of the project included:

- Institutional strengthening for climate change planning within the Environment and Conservation Division;
- The setting up of a Climate Change Study Team;
- Capacity building in understanding important resources such as the fresh ground water lens;
- Analysis of local climate data for comparison with global situation as given in IPCC Assessment Reports; and
- Incentives for officials to make efforts to understand certain IPCC Technical Reports.

Members of the Climate Change Study Team included representatives of key sectors such as meteorological services, water, land management, mineral resources, fisheries, public health, agriculture, energy, economic planning, and education. The private sector was represented by the USP Kiribati Centre. It was chaired by the most senior official of the Environment and Conservation Division, with a project coordinator being a member.

Capacity building continued under the Pacific Islands Climate Change Assistance Programme (PICCAP). Under this programme, the Climate Change Study Team (CCST) had a more focused agenda of preparing an Initial National Communication. Training modules on Vulnerability and Adaptation assessment became available from regional universities (Waikato University and the USP) which were attended by Kiribati nationals. A greenhouse gas inventory for 1994 was attempted and was included in Kiribati Initial National Communication.

After the completion of the PICCAP the Climate Change Study Team was temporarily inactive. However, the team was revived under the NAPA and KAP I projects. The NAPA and KAP I activities envisaged two committees for their management: the first is to provide policy direction for the projects, and the second to act as a technical committee. An Adaptation Steering Committee was formalized to give policy directions for the two projects, whilst the CCST deal with the technical works of the projects.

Due to a NAPA initiative, international advisors for the KAP were able to provide current climate tools for generating climate change scenarios. These scenarios were adopted in the Climate Change Adaptation Policy and Strategy that Cabinet approved. Prioritization criteria for NAPA proposed activities were also developed with the guidance of the advisors. In this way activities of the two projects were able to be harmonized.

Other capacity building initiatives have been undertaken over the years with support from a variety of development partners. The Climate Change Unit (CCU) of the ECD have benefited from regional trainings on various tools for assessing and planning for climate change impacts. In connection with the ADB consultancy on mainstreaming environmental concerns, a two day workshop was conducted for CCST members on climate change scenario generation based on past trends and incorporating global scenarios. Many members of the CCST and ECD staff attended a more recent training on the science of climate change and available tools and

information on climate prediction and mainstreaming. Additionally, efforts have been made to strengthen the meteorological services. Through an Australian regional project, the Meteorological Division has been strengthened in its capacity to develop and issue climate predictions. More meteorological stations were upgraded through KAP II and these will be supplemented by KAP III.

Since the submission of the Initial National Communication in 1999, there had been observed growing interests by academic and international organisations on Kiribati future vulnerabilities to the adverse impacts of climate change. This was evidenced by the number of Vulnerability and risk assessment conducted on specific sectors in Kiribati. These studies form part of a critical body of information that inform not only the Government of Kiribati in terms of their adaptation approaches but also the regional and international communities.

The strengthening of regulatory measures for the management and conservation of the environment is recognized as a key form of adaptation. With this in mind, the Kiribati government has strengthened the Environment Act of 1999 in a superseding Act. In addition, there are a number of other pieces of legislation which have implications for environmental management. The KJIP has indicated that it will be necessary to have a more detailed review of these legislations with a view to harmonize their effects for more effective environmental management and to build climate resilience.

The NCSA report indicated that although broad-based stakeholder consultation has been undertaken under the various adaptation programs and initiatives, public awareness and some mechanisms to communicate on timely basis climate and climate change information to the general public is still required. Attempts have been made but not on a continual basis and without well designed approach and clarity on target audiences, and contents. The NCSA report indicates that the approach of the Government to addressing capacity caps is to address the root causes of those gaps. The Report identified the following gaps in capacity to manage risks from climate change:

Table 5: Root causes of issues and concerns relating to the management of climate change risks in Kiribati

Themes	Root causes
Understanding the science of climate change	✓ Insufficient awareness and media programs on climate change ✓ Insufficient dissemination of CC information to the public ✓ Non-inclusion of climate change in national curriculum ✓ Technical problems at Meteorological Office ✓ Lack of meteorology information ✓ Lack of skills to carry out V&A assessments ✓ Poor performance and/or incompetence of staff working on climate change planning and management.
Vulnerability to climate change	✓ Insufficient funding; ✓ Insufficient human resource; ✓ Lack of legislation; ✓ Uncontrolled beach mining; ✓ Destruction of mangroves; ✓ Negligence to replant Mangroves; ✓ Illegal construction of poor design of seawalls and causeways; ✓ Lack of skills to carry out V&A; ✓ Poor Performance or incompetence of staff; ✓ Lack of understanding on designs/technologies; ✓ Limited vision to foresee climate change related impacts; ✓ Insufficient data.
Adaptation	✓ Insufficient data collection on vegetation; ✓ Insufficient data collection on land use and changes; ✓ Uncontrolled land use; ✓ Insufficient awareness and media programs on climate change adaptation; ✓ Insufficient funding; ✓ Insufficient human resource; ✓ Lack of legislation; ✓ Uncontrolled beach mining; ✓ Insufficient data

This final report of the Kiribati National Capacity Self Assessment (NCSA) Project presents a concise summary of key capacity issues affecting national ability to adequately manage risks from climate change, including: inadequate information management, limited financial resources, limited capacity to communicate, educate and raise awareness on key issues and influence behavioral change, limited coordination and integration amongst agencies and stakeholders to address environmental and climate change issues, weak enforcement of environmental laws and regulations, limited capacity to access development opportunities, limited mainstreaming of environmental and climate change issues into national strategies, plans and programmes, limited use of traditional knowledge and practices in environmental management and limited capacity to cope with reporting requirements of the conventions. The report ends with a presentation of the main capacity development actions needed to address the cross-cutting environmental and capacity issues.

The *Pacific Adaptation Strategies Assistance Programme – Kiribati National Stocktaking and Stakeholder Consultations Report* (October 2011) indicates that although previous adaptation project undertaken in Kiribati have built some level of capacity to manage climate change and sea level rise issues, these efforts are often hampered by the following:

a) Lack of technical capacity and capabilities;
b) Lack of reliable data and information relevant for informing adaptation decision-making;
c) Lack of or low level of climate change and sea-level rise awareness at the community or village level;
d) Lack of leadership across the various sectors;
e) Lack of predictable resources to supplement the needs; compounded by,
f) Growing complexity of emerging political climate change issues.

The *Kiribati Joint Implementation Plan on Climate Change and Disaster Risk Management* (KJIP) (2014) reports that the following capacity constraints are still to be addressed:

a) Only a few sectors have transferred strategic actions to address climate and disaster risks into their annual Sector Operational Plans and Ministerial Plans of Operations and budgeting.
b) Policies and strategies relating to human resource development, minerals and foreshore development, private sector development, investment, transport, communications, tourism and minerals do not explicitly consider climate change and disaster risks.
c) Most laws need to be reviewed as, with the exception of the Disaster Management Act 1995, they do not regulate responses to climate change and disaster risks and impacts.

MEANS OF IMPLEMENTATION

The effective implementation of the mitigation and adaptation measures will depend on timely accessibility, availability and provision of financial resources, technology and capacity building support. The provision of resources would build on, and where necessary, implement the various mitigation actions including grid-connected photovoltaic system under Japan PEC fund, the World Bank and UAE funds and continue with the implementation of the strategies and actions

espoused in the Kiribati Joint Implementation Plan for Climate Change and Disaster Risk Management (KJIP).

The Government of Kiribati intends to explore options for innovative and coordinated financing to implement the KJIP and community-based adaptation plans from varied sources such as multilateral and bilateral donors and regional and national funding mechanisms. Innovative financing approaches and operations will be explored, including options such as microfinance, carbon levies, subsidies, soft loans, emergency funds, sovereign insurance, contingent credit, catastrophe bonds, and intergovernmental risk insurance. Based on lessons learned and best practices from other SIDS such as Palau and the British Virgin Islands, the Government will investigate the viability of, amongst other measures: (i) setting aside the valued added tax (VAT) charged for fuel; (ii) charging carbon levies to offset greenhouse gas emissions for international air transport to the country; and (iii) charging fees for climate change research undertaken in the country. Such fees and charges will be used to establish and finance a climate change trust fund for priority climate change measures.

Additionally, the Government of Kiribati intends to build national capacity to facilitate direct access to international climate change financing including the Green Climate Fund so as to ensure that financing for climate resilience is country-owned and directed towards priority national needs and community-based adaptation plans. Based upon lessons learned from other SIDS, Kiribati will seek assistance under the “Readiness” program operated by the Green Climate Fund to establish the necessary legal, institutional and fiduciary management framework and accredit the National Implementing Entity (NIE) needed to facilitate direct access, thereby reducing dependence upon intermediary agencies for the design and implementation of priority adaptation interventions.

Indicative Costs and time line for provision of adaptation support

The *Kiribati Joint Implementation Plan on Climate Change and Disaster Risk Management* (KJIP) (2014) reports that the overall gross indicative resource costs to implement the KJIP over the period 2013–2023 are estimated to be AUD 103,107,161 (approximately US$75 million). Of this total, it is estimated that financial cost constitutes 96% of overall costs while the in-kind contributions constitute 4%. The costs by strategy are summarised in the table below. These costs are to implement the next phase in a constantly evolving adaptation program being implemented by Kiribati.

The implementation of the KJIP is to be financed through already existing strategies ranging from national budgets and other internal sources to overseas development assistance, additional climate change funding and humanitarian aid. It is expected that a considerable portion of the necessary financing will be provided in the forms of grants from the Green Climate Funds, Global Environment Facility (GEF), Adaptation Fund, and from various bi-lateral climate change programs.

Addressing gaps in national, sector and community-level adaptation and climate resilience programs

Most national policies and strategies such as NAPA, KJIP, and others emphasise the importance of engaging the widest possible circle of stakeholders (including NGOs, CSOs and the private sector) in order to achieve their environmental objectives. Kiribati Government is supporting NGOs and CBOs in the elaboration of national strategies and plans. However, with a focus on top-down adaptation mainstreaming, the current national implementation mechanism

has not ensured the greater synergy in the implementation, of community-based adaptation and climate resilience programs in alignment with national strategies and planning frameworks, so to effectively leverage the potential CSO and village communities' perspectives and engagement. It is the intention of the Government of Kiribati that a community-based vulnerability mapping, adaptation planning and management approach (tied to improved access to financing for community-based resilience-building projects) be employed on a whole of island basis that will build capacity in vulnerable villages for small scale localised adaptation actions which represents a critical contribution to the implementation and achievement of these national Climate Change and Disaster Risk Management policies and strategies. The Government of Kiribati will establish the institutional structures and strengthen capacities at the community level in order to support the country-wide implementation of community-based vulnerability mapping and adaptation planning, and the community-based design and implementation of priority resilience measures through improved access to financing for such measures. By fostering broader community engagement and ownership in building climate resilience at the local level, it is anticipated that long-term support will be sustained for priority adaptation interventions that address the basis needs of vulnerable villages and segments of society.

Table 6: Overall Costs by Strategy

Strategy	**Cost (A$,000)**	**%**
Strategy 1: Strengthening good governance, policies & legislation	6,697,308	6
Strategy 2: Improving knowledge and information generation, management and sharing	5,555,248	5
Strategy 3: Strengthening and greening the private sector inclduing small business	4,932,242	4
Strategy 4: Increasing water and food security with integrated and sector-specific approaches and promoting healthy and resilient ecosystems	4,693,577	4
Strategy 5: Strengthening health service delivery to address climate change impacts	472,747	2
Strategy 6: Promoting sound and reliable infrastructure development and land management	52,476,513	50
Strategy 7: delivering appropriate education, training and awareness programmes	7,478,480	7
Strategy 8: Increasing effectiveness and efficiency of early warnings and disaster emergency management	4,508,477	4
Strategy 9: Promoting use of sustainable renewable sources of energy and energy efficiency	15,340,322	11
Strategy 10: Strengthening capacity to access finance, monitor expenditures and maintain string partnerships	354,340	2
Strategy 11: Maintain the sovereignty and unique identity of Kiribati	180,532	1
Strategy 12: Enhancing the participation and resilience of vulnerable groups	417,375	2
TOTAL	**103,107,161**	**100**

The Government of Kiribati will also initiate measures to improve donor collaboration on climate change adaptation programming, and will establish the mechanisms for improved coordination amongst government agencies in the design and implementation of priority adaptation programs and projects as defined under the KJIP and community-based adaptation plans. A priority of the Government of Kiribati is to establish the Climate Change and Disaster Risk Management Unit in

the Office of the President (working in collaboration with the Department of Environment) as the gatekeeper, coordinator and entry point for climate change programming engagement with all development partners to ensure that all projects funded by external sources support the implementation of the KJIP and community-based adaptation plans. In the exercise of this function and responsibility, the Office of the President and the Department of Environment shall ensure that international climate change programming supports the implementation of the KJIP and community-based adaptation plans.

Equity

The Republic of Kiribati is a smallest contributor to the greenhouse gas emissions by any measurable indicator and yet it is at the frontline of the wrath of climate change and sea level rise. Kiribati has a right to develop its economy and improve the well-being of its population. Thus Kiribati's contribution towards limiting the global temperature to below 2^0C relative to pre-industrial levels provides a moral imperative as a global citizen. The government has embarked on a number of actions which will result in increasing the use of renewable energy technologies, improve energy security and reduction of GHG emissions. However, the main focus for long term sustainable development still remains adaptation to climate change by addressing the adverse impacts of climate change and its consequent sea-level rise.

INTENDED NATIONALLY DETERMINED CONTRIBUTION
REPUBLIC OF INDONESIA

National Context

Indonesia is a nascent yet stable democracy and the fourth most populous country in the world. Despite continuous, multi-decade economic growth, approximately 11% of Indonesia's population is living below the poverty line. To lift people out of poverty, the Government of Indonesia (GOI) is promoting economic development projected to average at least 5% per year in order to reduce the poverty rate to below 4% by 2025, as mandated by the Indonesian Constitution, inter alia, that "*every person shall have the right to enjoy a good and healthy environment.*" As climate change becomes a reality, Indonesia must continue to seek a balance between its current and future development and poverty reduction priorities.

Indonesia's strategic development goals, known as the *Nawacita* (or Nine Agenda Priorities), charts the transitional path towards realizing meaningful and long-term changes, aligning Indonesia's vision as a politically sovereign and economically self-reliant nation with deep roots in its cultural identity. These priorities are consistent with the national commitment to climate change resilience, where climate change adaptation and mitigation are integrated as cross-cutting priorities of the National Medium-Term Development Plan. As the largest archipelagic country in the world, with its internationally recognized Archipelago Doctrine (*Wawasan Nusantara*), Indonesia also needs to articulate its maritime vision in its development priorities.

Given its pivotal geographic position in the global ocean conveyor belt (thermohaline circulation), and its extensive tropical rainforests, with high biodiversity, high carbon stock values and energy and mineral resources, Indonesia recognizes its role to play in combatting global climate change, Nevertheless, Indonesia is also vulnerable to natural disasters that will likely be exacerbated by climate change, especially in low-lying areas throughout the archipelago. Therefore Indonesia views integrated land- and ocean-based climate change adaptation and mitigation efforts as a critical strategic consideration in achieving climate resilience in food, water and energy.

Indonesia's Intended Nationally Determined Contribution (INDC) outlines the country's transition to a low carbon future by describing the enhanced actions and the necessary enabling environment during the 2015-2019 period that will lay the foundation for more ambitious goals beyond 2020, contributing to the concerted effort to prevent 2^0C increase in global temperature. For 2020 and beyond, Indonesia envisions achieving archipelagic climate resilience as a result of comprehensive adaptation and mitigation programs and disaster risk reduction strategies. Indonesia has set ambitious goals for sustainability related to production and consumption of food, water, and energy. These goals will be achieved by supporting empowerment and capacity building, improved provision of basic services in health and education, technological

innovation, and sustainable natural resource management, in compliance with principles of good governance and broader constituence strengthening.

Mitigation

According to Indonesia's Second National Communication of 2010, national greenhouse gas (GHG) emissions were estimated to be 1,800 $MtCO_2e$ in 2005. This represents an increase of 400 $MtCO_2e$ compared to 2000. Most emissions (63%) are the result of land use change and peat and forest fires, with combustion of fossil fuels contributing approximately 19% of total emissions. It is important to note that fossil energy resource extraction also contributes to land use change emissions. The Indonesia baseline uses the business as usual scenario of emission projections starting in 2010, based on historical trajectory (2000-2010), projected increases in the energy sector and the absence of mitigation actions.

In 2009, Indonesia voluntarily pledged to reduce emissions by 26% on its own efforts, and up to 41% with international support, against the business as usual scenario by 2020. Since then Indonesia has promulgated relevant legal and policy instruments, including the national action plan on GHG emissions reduction as stipulated in Presidential Regulation (PERPRES) No. 61/2011 and GHG inventory through Presidential Regulation (PERPRES) No. 71/2011. Beyond 2020, Indonesia envisions an even bolder commitment to emission reductions. Based on the country's most recent emissions level assessment, the unconditional reduction target is 29% of the business as usual scenario by 2030. In order to support the beyond 2020 target, Indonesia recognizes the need for consolidating both methods and data sources to ensure the high degree of accuracy.

Indonesia has taken significant steps to reduce emissions from Land Use, Land-Use Change and Forestry (LULUCF) by instituting a moratorium on the clearing of primary forests and by prohibiting conversion of peat lands from 2010-2016. Those ongoing efforts will be strengthened through protection and conservation of its remaining forests by reducing deforestation and forest degradation, restoring ecosystem functions, as well as sustainable forest management which include social forestry through active participation of the private sector, small and medium enterprises, civil society organizations, local communities and the most vulnerable groups, especially *adat* communities, and women - in both the planning and implementation stages. A landscape-scale and ecosystem management approach, emphasizing the role of sub-national jurisdictions, is seen as critical to ensuring greater, more enduring benefits from these initiatives.

In energy sector, Indonesia has embarked on a mixed energy use policy, with at least 23% coming from new and renewable energy by 2025. Indonesia has also established the development of clean energy sources as a national policy directive. Collectively, these policies will put Indonesia on the path to de-carbonization.

For the waste management sector, the GOI is committed to develop a comprehensive strategy to improve policy and institutional capacity at the local level, enhance management capacity of urban waste water, reduce landfill waste by promoting the "Reduce, Reuse, Recycle" approach, and the utilization of waste and garbage into energy production. The GOI is committed to further reduce emissions from the waste management sector by 2020 and beyond, through

comprehensive and coherent policy development, institutional strengthening, improved financial and funding mechanisms, technology innovation, and social-cultural approaches.

Adaptation

As an archipelagic state with extensive low-lying areas, Indonesia is highly vulnerable to the adverse impacts of climate change. Indonesia has already experienced extreme climate events such as floods and drought, and will likely see long-term effects from sea level rise. As the Indonesian population grows, climate change-induced natural disasters will impact a greater number of people and their assets, making it more difficult for them to rise out of poverty. It is believed that climate change will increase the risk of hydro-meteorological disasters, which make up 80% of disaster occurrences in Indonesia. The poorest and most marginalized populations tend to live in high-risk areas that are prone to flooding, landslides, sea level rise, and water shortages during drought. Most of these areas have experienced rapid urbanization, reaching 50% in 2010.

Climate change presents significant risks for Indonesia's natural resources that will, in turn, impact the production and distribution of food, water, and energy. Therefore, the GOI considers climate mitigation and adaptation efforts as an integrated concept that is essential for building resilience in safeguarding food, water and energy resources. The GOI has made significant efforts towards developing and implementing a National Action Plan on Climate Change Adaptation (RAN-API) which provides a framework for adaptation initiatives that has been mainstreamed into the National Development Plan.

The GOI will implement enhanced actions to study and map regional vulnerabilities as the basis of adaptation information system, and to strengthen institutional capacity and promulgation of climate change sensitive policies and regulations by 2020. The medium-term goal of Indonesia's climate change adaptation strategy is to reduce risks on all development sectors (agriculture, water, energy security, forestry, maritime and fisheries, health, public service, infrastructure, and urban system) by 2030 through local capacity strengthening, improved knowledge management, convergent policy on climate change adaptation and disaster risks reduction, and application of adaptive technology.

Planning Process

The GOI has demonstrated its strong commitment to institutional development by establishing the Directorate General of Climate Change, under the Ministry of Environment and Forestry. Established by Presidential Regulation No 16 of 2015, the Directorate General serves as the National Focal Point for the Conference of the Parties (COP) of the United Nations Framework Convention on Climate Change (UNFCCC) to effectively facilitate ongoing relevant programs and processes being implemented by a variety of government sectors and stakeholders. Since climate change has local to national and international dimensions, coordination and synergy will continuously be enhanced between the Ministry of Environment and Forestry with Ministry of National Development Planning (BAPPENAS) in the context of climate change and national development and with Ministry of Foreign Affairs in the context of climate change and international negotiations.

To further strengthen institutional capacity, Indonesia is developing appropriate legal instruments for environmental protection and management, spatial planning, renewable energy, and coastal and small islands management. In addition to these legal instruments, Indonesia has created regulatory frameworks specifically on climate change mitigation, and the National Action Plan on Climate Change Adaptation (RAN-API).

In the preparation of the INDC, the GOI has conducted consultations with various stakeholders representing academia, the private sector, and civil society organizations; these consultations have included workshops and consultations organized at both the national and local levels. The preparation of the INDC has taken into account the Post-2015 Sustainable Development Goals (SDG) particularly on taking urgent action to combat climate change and its impacts, promoting food security and sustainable agriculture, achieving gender equality, ensuring the availability and sustainable management of water, access to affordable, reliable, and renewable energy for all, sustained, inclusive and sustainable economic growth, resilient infrastructure, sustainable consumption and production patterns, conservation and sustainable use of the oceans, seas and marine resources, and protecting, restoring and promoting sustainable use of terrestrial ecosystems, sustainably managing forests, combating desertification, and halting and reversing land degradation and biodiversity loss.

Strategic Approach

Indonesia requires a comprehensive and thorough plan to effectively implement sustainable production and consumption patterns, benefiting from the diversity of traditional wisdom of our indigenous institutions, known as the *adat* communities. Broader constituence building is also deemed critical through effective engagement with faith based networks as well as the existing interfaith movement. Therefore, the strategic approach of Indonesia's INDC is predicated on the following foundational principles:

- Employing a landscape approach: Recognizing that climate change adaptation and mitigation efforts are inherently multi-sectoral in nature, Indonesia takes an integrated, landscape-scale approach covering terrestrial, coastal and marine ecosystems, implemented through capacity building of the sub-national jurisdictions.
- Highlighting existing best practices: Recognizing significant strides in multi-stakeholder efforts in combating climate change, Indonesia intends to scale up the diversity of traditional wisdom based as well as innovative climate mitigation and adaptation efforts by government, the private sector, and communities.
- Mainstreaming climate agenda into development planning: Recognizing the importance of integrating climate change into development and spatial planning and the budgeting process, Indonesia will include key climate change indicators in formulating its development program targets
- Promoting climate resilience in food, water and energy: Recognizing the need to fulfill the needs of a growing young population for food, water and energy, Indonesia will improve its management of natural resources to enhance climate resilience by protecting and restoring key terrestrial, coastal and marine ecosystems.

In order to maintain consistent and credible accounting of the monitoring, reporting and verifying (MRV) program, Indonesia has established Presidential Regulation (PERPRES No. 71, 2011) that were designed to take into account national characteristics and circumstances.

Indonesia's commitment to a low carbon future outlines enhanced actions and puts in place the necessary enabling environment for the 2015-2019 period that will lay the foundation for more ambitious goals beyond 2020. This would provide opportunities for building coherent actions at the national level, with particular emphasis on research, resource mobilization through partnerships, and international cooperation. The Indonesian Environmental Protection and Management Law of 2009 secures the legal framework to support 2015-2019 enhanced action strategies and actions, which would serve as enabling conditions for long-term policy of 2020 and beyond. However, to achieve long-term policy goals, a comprehensive legal harmonization of all relevant matters related to climate change is seen as critical to meet the daunting challenges of climate change mitigation and adaptation.

Information to Facilitate Clarity, Transparency and Understanding

Reduction Level

(a) Unconditional Reduction

Indonesia has committed to reduce unconditionally 26% of its greenhouse gases against the business as usual scenario by the year 2020.

The above commitment is a necessary prerequisite for embarking on a bolder commitment to further reductions by 2020 and beyond by outlining an emissions reduction plan using an evidence-based and inclusive approach. The commitment will be implemented through, , effective land use and spatial planning, sustainable forest management which include social forestry program, restoring functions of degraded ecosystems, improved agriculture and fisheries productivity, energy conservation and the promotion of clean and renewable energy sources, and improved waste management.

As stated earlier, Indonesia is committed to reducing emissions by 29% compared to the business as usual (BAU) scenario by 2030, as a fair reduction target scenario based on the country's most recent assessment of the 2010's National Action Plan on GHG Reduction. The BAU scenario is projected approximately 2.881 $GtCO_2e$ in 2030.

(b) Conditional Reduction

As articulated in the aforementioned Unconditional Reduction Indonesia's target should encourage

	support from international cooperation, which is expected to help Indonesia to increase its contribution up to 41% reduction in emissions by 2030. Indonesia's additional 12% of intended contribution by 2030 is subject to provision in the global agreement including through bilateral cooperations, covering technology development and transfer, capacity building, payment for performance mechanisms, technical cooperation, and access to financial resources.
Type	Emissions reduction relative to a Business As Usual (BAU) baseline
Coverage	Nationwide with a landscape and ecosystem management approach in both adaptation and mitigation efforts by building and strengthening sub-national jurisdictional capacity.
Scope	• Carbon Dioxide (CO_2) • Methane (CH_4) • Nitrous Oxide (N_2O)
Baseline	BAU scenarios of emission projection started in 2010, with each sector having various data year interval. For example, the historical data of land-based sector is available from 1990-2012, as seen in Indonesian FREL-REDD+ submission.
Fair and Ambitious	Indonesia GDP growth rate has slowed between 2010-2015, from 6.2-6.5% per annum to only 4.0% (first quarter 2015). Indonesia's population has increased at an average rate of 1.49% during the period of 2010-2010, posing challenges for Indonesia in fulfilling energy demand, ensuring food security, and fulfilling livelihood needs. At the same time, poverty alleviation remains a challenge for Indonesia, with 10.96% of the population still living in poverty in 2014, and the unemployment rate at 5.9%. Despite the challenges common to other developing countries, Indonesia is committed to transition its current development pathway toward climate resilience in a phased approach. The pathway towards de-carbonization of the economy will be fully integrated into Indonesia's National Medium-Term Development Plan for the period 2019-2024. Indonesia also considers to work on finding the

	peaking time of national GHGs emissions necessary to meet the national sustainable development objectives while contributing to the global efforts to fight against the dangerous impacts of climate change.
Perspectives on Vulnerable Groups, including Gender and *Adat* Communities	These policies and actions include an emphasis on encouraging participation of the most vulnerable groups, including *adat* communities, the poor, and women, in order for the measures to be effectively implemented, and provide equitable benefits for all citizens.

Key Assumptions on Mitigation

Metric Applied	Global Warming Potential (GWP) on a 100 year timescale in accordance with the IPCC's 4th Assessment Report.
Methodology for Estimating Emissions	Inventory is based on 2006 IPCC Guidelines for National Greenhouse Gas inventories and the IPCC GHG for LULUCF. All data will refer to the National Inventory System of Greenhouse Gases (SIGN SMART), UNFCCC Biennial Update Report (BUR), and FREL-REDD+ document.
Baseline	Assumptions used for baseline projection and policy scenarios for the 2020 to 2030 period are: • Long-term economic growth will still be influenced by land use governance, tenurial issues energy consumption, and quality of infrastructure connecting the archipelago. • Beside GDP per capita, population growth, energy intensity and value added, the increasing demand of both domestic and international market on natural resources based commodities influence the dynamic behavior of each sector and the economy. • Policy scenario for post 2020 in the energy sector refers to Electricity Supply Business Plan (RUPTL) 2015-2024 and National Energy Policy (KEN).
Measurable, Reportable, Verifiable (MRV)	Indonesia commits to periodically communicate its greenhouse gases emissions from various sectors, including the status of emission reduction efforts and results to Secretariat of UNFCCC. Indonesia is

currently preparing the Third National Communication Report (TNC), to be submitted by 2016. Indonesia produced the Biennial Update Report (BUR) along with the INDC document.

Coverage

- Sectors/Source Categories

1. Energy (including Transport)
2. Industrial Processes and Product Use
3. Agriculture
4. Land-use, Land-use Change and Forestry
5. Waste

- **International Market Mechanisms**

Indonesia will meet its unconditional commitments regardless of the existence of international market mechanisms. Indonesia welcomes bilateral, regional and international market mechanisms that facilitate and expedite technology development and transfer, payment for performance, technical cooperation, and access to financial resources to support Indonesia's climate mitigation and adaptation efforts towards a climate resilient future.

Review and Adjustment

The INDC reflects the most recent information and analysis by the Government of Indonesia. As a developing country, Indonesia will likely experience dynamic changes due to national and global economic changes. In this regard, the INDC will be reviewed and adjusted, as necessary, up to the time of Indonesia's ratification to the legal instrument to be agreed in COP-21.

Annex Indonesia Climate Resilience Strategy

I. Introduction

The Government of Indonesia considers climate mitigation and adaptation efforts as an integrated concept that is essential for building resilience in safeguarding food, water and energy resources. Indonesia also views its development pathway towards climate resilience as consistent with its commitment to contribute to the global effort for achieving Sustainable Development Goals (SDGs). These global agendas will be contextualized given Indonesia's unique archipelagic geography, and its position within the global ocean conveyor belt (thermohaline circulation) and its extensive tropical rainforests, with their high biodiversity and high carbon stock value. Indonesia is also a nascent yet stable democracy and the fourth most populous country in the world, with the largest generation of young people and the most working-age people in its history.

II. Indonesia's Vulnerability to Climate Change

As an archipelagic country with extensive low-lying and small island areas, Indonesia is highly vulnerable to the adverse impacts of climate change. Indonesia has already experienced extreme climate events such as floods and drought, and is anticipating long-term impacts from sea level rise. As the Indonesian population grows, climate change-induced natural disasters will affect a greater number of people and their assets, making it difficult for them to escape poverty.

Climate change is believed to increase the risk for hydro-meteorological disasters, which make up 80% of disaster occurrences in Indonesia. The poorest and most marginalized populations tend to live in high-risk areas that are prone to flooding, landslides, sea level rise, and water shortages during drought.

As the country with the second longest coastline in the world, Indonesia faces a high risk of coastal inundation and sea level rise that may affect up to 42 million people living in low elevation coastal zones. Most of these areas have experienced rapid urbanization, reaching 50% in 2010.

The vulnerability of Indonesia's coastal zone is also affected by the rate of deforestation and forest degradation. The loss of forest ecosystems leads to the loss of critical environmental services, providing for water catchment areas, preventing erosion and floods, and protecting against the loss of biodiversity.

In order for Indonesia to reduce its vulnerability to climate change, it must strengthen its climate resilience by integrating its adaptation and mitigation efforts in development planning and implementation.

III. Priority Actions for Climate Resilience

In 2010 the Government of Indonesia pledged to reduce emissions by 26% (41% with international support) against the business as usual scenario by 2020. The current administration, under President Joko Widodo, has determined priority actions within the national *Nawa Cita* (Nine Priority Agendas) framework, which includes protecting Indonesia's citizens, encouraging rural and regional development, improving the quality of life, and improving productivity and global competitiveness. These core missions are consistent with the national commitment toward a climate change-resilient development path, in which climate change adaptation and mitigation constitute an integrated and cross-cutting priority of the National Medium-Term Development Plan. The following priorities for enhanced actions in 2015-2019 will be fully integrated into Indonesia's National Medium-Term Development Plan in 2020.

Enabling conditions for climate resilience

Indonesia's pathway toward climate resilience must be developed by building a strong foundation based on the following enabling conditions:

- Certainty in spatial planning and land use
- Tenurial security
- Food security
- Water security
- Renewable energy

Economic resilience

Climate change presents significant risks for Indonesia's natural resources that will in turn impact the production and distribution of food, water and energy. As the population grows, there will be increasing pressures on Indonesia's already limited resources. As a response, Indonesia plans to build resilience into its food, water and energy systems through the following enhanced actions:

- Sustainable agriculture and plantations
- Integrated watershed management
- Reduction of deforestation and forest degradation
- Land conservation
- Utilization of degraded land for renewable energy
- Improved energy efficiency and consumption patterns

Social and Livelihood Resilience

Climate change impacts the day-to-day lives of all Indonesians, but most severely Indonesia's most vulnerable populations. Climate change-induced natural disasters will impact a greater number of people living below the poverty line, preventing asset accumulation. Rising food,

water and energy prices, which often follow drought, floods, and other disasters, will drive the poor further into poverty. Socio-economic disparity will potentially contribute to political instability in regions most affected by climate change. To prevent further disparity, Indonesia plans to build social resilience through the following actions:

- Enhancement of adaptive capacity by developing early warning systems, broad-based public awareness campaigns, and public health programs;
- Development of community capacity and participation in local planning processes, to secure access to key natural resources;
- Ramping up disaster preparedness programs for natural disaster risk reduction;
- Identification of highly vulnerable areas in local spatial and land use planning efforts.
- Improvement of human settlements, provision of basic services, and climate resilient infrastructure development.
- Conflict prevention and resolution.

Ecosystem and Landscape Resilience

As an archipelagic country with high biodiversity, Indonesia's highly diverse ecosystems and landscapes provide various environmental services such as watershed protection, carbon sequestration, disaster risk reduction, etc. In order to build climate resilience, Indonesia must protect and sustain these environmental services by taking an integrated, landscape-based approach in managing its terrestrial, coastal and marine ecosystems. The following are enhanced actions to support ecosystem and landscape resilience:

- Ecosystem conservation and restoration
- Social forestry
- Coastal zone protection
- Integrated watershed management
- Climate resilient cities.

REPUBLIC OF NAURU

Intended Nationally Determined Contribution (iNDC) Under the United Nations Convention on Climate Change

Introduction

The Republic of Nauruis one of the smallest independent, democratic states in the worldand is fully committed to supporting a successful outcome from the COP 21 on a new, ambitious, universaland legally binding agreement under the UNFCCC.

In this regard, the Republic of Nauru wishes to submit its initial Intended Nationally Determined Contributions (INDC) to the UNFCCC in accordance with the relevant paragraphs of Decision1/CP.19 and 1/CP.20. Being a Small Island Developing State (SIDS), as per the Lima decision 1/CP.20 in paragraph 11, Nauru is mainly communicating information on strategies, plans and actions for climate resilience and low greenhouse gas emission development.

Nauru reserves the right to revise this initial INDC prior to finalization and/or ratification under a new global climate agreement.

Executive Summary

Nauru's Intended Nationally Determined Contribution (INDC) hinges on its National Sustainable Development Strategy (NSDS) 2005 – 2025 (revised in 2009), The Nauru Energy Road Map 2014-2020, The Second National Communication (SNC) to the UNFCCC (submitted in 2015), and The Republic of Nauru Climate Change Adaptation and Disaster Risk Management Framework (RONAdapt). In addition, relevant data and information have been used from the Nauru Bureau of Statistics and other,various government departments, private and civil society organizations. Extensive consultations with all relevant stakeholders were held during the preparation of Nauru's INDC. Like other small island nations Nauru has been profoundly disturbed with the implications of climate change since the problem appeared on the world scene. Being one of the smaller low lying island nations it is particularly vulnerable to the impacts of climate change including sea level rise.

With only around 10,000 persons, Nauru has very limited capacity to respond to a global threat of this magnitude. As such its response has to be streamlined to sit within its capabilities. In this respect its main concern is adaptation. This concern is predicated on projected temperature increases due to existing and inevitable near term future levels of greenhouse gases in the atmosphere which will be sufficient to cause global warming well beyond the 1.5 degrees Celsius that is considered safe for SIDS. This temperature increase will put in place an inevitable sea level rise that will be an existential threat to the Nauruan population.

In terms of adaptation Nauru is keen to improve its resilience which has been severely compromised by nearly a century of intensive phosphate mining. One such improvement will be transition to untapped clean energy sources, such as renewable resources rather than relying on the traditional imported dirty liquid fuels. The other pressing adaptation strategy is to improve the indigenous food supply and potable water availability and storage. In addition there is a concurrent need to rehabilitate the environment and improve the health of the population. The issue of loss and damage is important to Nauru, particularly when considering the current low level of mitigation ambition internationally and the science is telling us that there will be limits to adaptation. For our very survival it is fundamental that loss and damage must be considered as a separate and distinct element from adaptation in the 2015 COP21 agreement.

The main mitigation contribution is to achieve the outcomes and targets under the National Energy Road Map (NERM), NSDS and recommendations under the SNC and is conditional on receiving adequate funding and resources.

The key mitigation intervention is to replace a substantial part of the existing diesel generation with a large scale grid connected solar photovoltaic (PV) system which would assist in reducing the emissions from fossil fuels. Concurrent to the above there needs to be put in place extensive demand side energy management improvements which will complement the PV installation. The demand management improvements are expectedto reduceemissions by bringing down diesel consumption further.

The cost of these mitigation measures is likely to be around US$50 million (US$ 42 million for Solar PV and US$ 8 million for demand side energy efficiency measures) with some uncertainty depending on the storage of energy either as electrical (battery) or thermal (chilled water) to account for the high night time electrical load on the island.

Due to somewhat higher phosphate extraction in past years Nauru's emissions in 1990 were higher than at present and estimated to be around 80kt. If economic activity proceeds at the current pace the BAU estimate for 2030 emissions of CO_2 only will also be around 80 kt.

The mitigation contribution will be contingent on obtaining funding and technical assistance to put in place the energy transition and energy savings measures.

In conclusion, although a very small nation, Nauru wishes to play its part in the enormous challenge presented to the world by threat of global warming. In Nauru's case the threat is to its very existence.

National Circumstances

The Republic of Nauru is one of the smallest independent, democratic states in the world housing a little over 10,000 persons. Nauru is a small, isolated, coral capped island which is 21 km^2 in area, 20 km in circumference. It islocated in the central Pacific Ocean 42 km south of the equator and 1287 km west of the International Date Line.

Nauru is clearly one of the most severely impacted nations on earth from environmental degradation. It has been the subject of intense mining for the critical element phosphate for a good part of the 20th century. The mining has removed a large proportion of original forest, and arable land. Scarcity of arable land and fresh water resources, geographic isolation, dependence on imports for meeting basic food and energy needs, environmental degradation and the emergence of chronic health problems all make achieving sustainable development a difficult task, and at the same time also create vulnerability to other stresses, such as those brought on by climate change.

The phosphate, however, is now running out and it has only been recently that the Government has commenced secondary mining of the spent spoils of earlier extraction. The island is very low lying with the coastal areas only a few meters above sea level and not much higher in the central area. Along with the above characterisation the country has a number of challenges that make it quite unique in terms of facing the vagaries of climate change.

Nauru faces a full range of geologic and climatic hazards and is also subjected to climatic variability and extremes. The main climate change vulnerabilities in Nauru include drought, sea level rise and the effect that an increase in temperature will have on marine resources and already stressed water and vegetative resources. Due to environmental degradation, the island is already experiencing coastal erosion and declines in the productivity of its coral reef systems. Rising ocean temperatures, ocean acidification, sea level rise, and an increase in the number of intense storms and droughtwill cause further damage to these ecosystems. Climate-related disasters have already had huge impacts on the economic growth and national development.

A number of development strategies and policy instruments as a response to climate change have been introduced by the Government since 2005 through the economic reform programme which includes: NSDS 2005-2025 (rev 2009); Nauru’s Utility Sector-A Strategy for Reform; National Energy Policy Framework; National Energy Roadmap 2014-2020; Nauru Utilities Cooperation Act and RONAdapt. However, Nauru's accomplishment remains on paper and it would require the necessary means of implementation through finance, capacity building and technology development and transfer to achieve tangible outcomes.

In common with many other small island nations the Government of Nauru realises the difficulties in terms of mitigation and has adaptation to climate change as its top priority. In this respect a transition from relying on imported fossil fuels by putting in place an indigenous solar energy supply is also an adaptation strategy to become more resilient and has as a co-benefit, mitigation.

Adaptation

The Government of the Republic of Nauru considers the focus of its INDC to be primarily adaptation, with a strong emphasis on building resilience which also encompasses mitigation in an integrated manner. Through this approach the INDC serves to highlight our national sustainable development priorities, which encompass adaptation priorities. These include identifying current gaps and needs for support in terms of addressing adaptation on the ground.ThisINDC does not constitute additional commitments from Nauru. Rather, Nauru views its planned adaptation actions, and broader focus on building resilience, as part of the international commitment to Nauru under the UNFCCC.

Climate change adds to the already significant challenges of achieving the NSDS goals and it undermines food and water security, erode coastlines, damage marine ecosystems and will impede on progress already made. The impacts of climate change will also add extra burden to the national budget diverting resources away from other important sectors and activities such as education, health and economic development. Therefore, addressing climate change in the context of sustainable development means that there will be co-benefits for not only achieving the NSDS but also in building the resilience of Nauru to climate change.

Vulnerability in the case of Nauru is a combination of different factors including climate change. The NSDS outlines Nauru's main social, economic and environmental challenges, and key development priorities. These developmental and environmental challenges illustrate Nauru's vulnerability to external stresses and risks, including those posed by climate change. At the national and community scale in Nauru, some of the factors that create vulnerability are: scarce water resources; limited land and soil resources; environmental degradation; high concentration of income activities; dependence on imports; geographical isolation; low human capacity; chronic health problems; aid dependency; and risk of climate change and disaster. Further priorities are expected to emerge over time as Nauru increases its capacity to respond to vulnerability and risk or its lack of capacity to respond.

Nauru has taken successful steps to establish our RONAdapt as part of our national efforts to prepare for adaptation.The RONAdapt represents the Government of Nauru's response to the risks to climate change and disaster risk reduction and is therefore aligned with the development priorities embedded in the NSDS. It is intended to support achievement of our NSDS goals, by highlighting a series of actions that will also reduce Nauru's vulnerability to climate change and disasters. In doing so, it will improve the country's social, economic and environmental resilience.

Priority actions are given to those that will work towards the goals in the NSDS, as well as those in sectoral plans and strategies where these already give consideration to climate change and disaster risks. The priorities outlined targets the following goals:

- Water security;
- Energy security;
- Food security;
- A healthy environment;
- A healthy people

- Productive, secure land resources.

High priorities are given to actions that can contribute towards multiple development and resilience objectives simultaneously, often cross cutting across sectors. The priority actions are arranged under sectors targeting the following areas: water; health; agriculture; energy; land management and rehabilitation; infrastructure and coastal protection; biodiversity and environment; community development and social inclusion; and education and human capacity development. However, as highlighted earlier, the actions generally contribute to the goals of multiple sectors and at the same time to the overall NSDS goals.

Nauru faces a multitude of challenges, barriers and gaps. These include information gaps, limited capacity both institutional and human, and the unavailability of appropriate adaptation technology and lack of funds at the national level. Lack of funding at the national level has prevented many larger infrastructure projects from getting underway, such as a new hospital, electricity transmission system, improvements to port and airport, and land rehabilitation. At the national level, there are no nationally focussed adaptation projects due largely to the very limited funds available at the national level. At the regional level, Nauru is also involved in a relatively low but increasing number of adaptation projects and programmes and through the regional projects and programmes, some actions are being implemented on the ground that addresses the needs in relation to coastal zone management, water, capacity building, gender, policy and planning.

Addressing the challenges, barriers and gaps are therefore important for building the resilience of Nauru. These can be addressed through building and strengthening the information gap that are vital for planning and management in many sectors as sectors are currently constrained by poor information about current conditions and/or likely future changes. Strengthening institutions are also important actions and undertakings for adaptation in Nauru and this includes the finalisation of policies and plans that have only been progressed to draft form. Strengthening institutions for Nauru will also entail the need to build the human capacity of sectors. Human capacity is a critical part of capacity building in Nauru and is currently a major weakness in almost every sector. This could be addressed through activities funded and/or implemented with support of external partners, aiming to maximise opportunities for skills transfer to local staff and/or communities and to require future externally funded development projects, including those focused on climate change adaptation and disaster risk management to emphasise skills transfer components. In addition, the up-skilling of local staff should be a core priority of all project activities, since it will help position Nauru better to be able to respond to an array of future challenges, including planning for and responding to climate change and disasters.

The need for development of new technologies and transfer of existing appropriate technologies for adaptation in Nauru cannot be overstated. Technology Needs Assessment (TNA) will help countries like Nauru track their needs for new equipment, techniques, services, capacities and skills necessary to build resilience to climate change. However, TNA has not been initiated in Nauru due to various constraints including lack of institutional, human and financial capacity. The preparation of a detailed technology needs for adaptation is an important next step.

Implementation of many of the adaptation priorities will be heavily dependent on resources being made available by external development partners, to supplement limited domestic

funds. While dedicated climate funds are available at the international level, these can be challenging to access for a small country like Nauru. Therefore, Nauru intends to place considerable emphasis on working with its bilateral partners, regional agencies, for the financial and technical resources needed to implement its adaptation priorities, including the improvement of access and facilitation to international climate finance.

Responsibility for implementing climate change adaptation and disaster risk reduction related activities is shared across different parts of government and the community. However, at the operational level, the Department of Environment under the Ministry of Commerce, Industry and Environment (CIE) has the primary responsibility for coordination, monitoring progress and reporting on the RONAdapt implementation of Nauru's climate change activities at all government department/sector levels.

Monitoring and evaluation (M&E) are critical tasks for tracking progress on the implementation of climate change adaptation and disaster risk reduction priorities and goals. The M&E framework for adaptation reflects the desire for tracking and for learning, but also recognises the limited institutional, human and financial resources available in Nauru to dedicate to M&E.

The priority activities highlighted in the RONAdapt require, in most cases, further development through some additional steps before they are ready to be implemented. The financial costs for the activities are not provided, since there is insufficient detail on individual activities to be able to accurately indicate costs. The preparation of detailed cost estimates is an important next step in implementing each activity and it is expected to be undertaken in conjunction with the process of detailed design of the activities.

Loss and Damage from climate change

Loss and damage is a significant issue for Nauru. The inclusion of loss and damage in the INDC is twofold. First, its purpose is to highlight the significance of the issue for Nauru and second, to present our views on loss and damage in the 2015 climate agreement.

The reality of the impacts of climate change that Nauru and Small Island Developing States (SIDS) are already experiencing means adaptation is absolutely critical. However, the science is telling us that we are quickly moving towards a reality where adapting will not be sufficient. The prospect for loss and damage associated with climate change for Nauru and SIDS are real. The IPCC findings in both the Fourth and Fifth Assessment Report from Working Group II show that there are substantial limits and barriers to adaptation. In Warsaw, Parties also acknowledged that loss and damage associated with the adverse effects of climate change involves more than that which can be reduced by adaptation.

The climate change projection for Nauru is expected to increase sea surface temperatures, rise in sea levels, ocean acidification and changes in ocean currents. These will in turn, impact on the whole of Nauru. The ability of corals and invertebrates to form will be affected by ocean acidification; coral bleaching will increase as a result of higher sea-surface temperatures; and the abundance of key oceanic fish species will be affected by changes to ocean currents, such as the Southern Equatorial Current, and to the area and location of the PEQD and the Warm Pool and their convergence. Sea level rise threatens to increase saltwater intrusion into precious groundwater reserves as well as to exacerbate coastal erosion and flooding during storm events, and changes in rainfall patterns will likely affect

water scarcity, while important fish resources may be affected by changes in ocean temperature and acidification.

Nauru calls for loss and damage to be included as a separate element of the 2015 agreement, one that is separate and distinct from adaptation. Loss and damage must be addressed in a robust, consistent and sustained manner. This can only be accomplished through a loss and damage mechanism that is anchored in the 2015 agreement. Anchoring the mechanism in the 2015 agreement will ensure that it is permanent.

Defining the relationship between mitigation, adaptation and loss and damage needs to be considered and reflected in the 2015 agreement, including a clearly defined relationship between mitigation ambition, adaptation costs as well as loss and damage, particularly when mitigation ambitions are currently grossly inadequate and adaptation measures are not sufficient to address climate impacts.

There is also an urgent need for technical work to be undertaken and should include an assessment of impacts and risks at different levels of CO2 concentration and warming, including 1.5 ℃, especially the risks of ocean acidification, global and regional sea level rise and irreversible changes in the physical, ecological and human systems, including for specific regions and key sectors and systems. Observations and projections relevant to local and regional circumstances should cover exposure and vulnerability to climate change, the resulting impacts, adaptation options and loss and damage.

Nauru acknowledges that there is on-going work under the Warsaw International Mechanism on Loss and Damage, including a 2016 Review, and expects that the results of this on-going work be integrated into the mechanism that is anchored in the 2015 agreement.

Immediate and adequate financial, technical and capacity building support for loss and damage is needed and to be provided on a timely basis for Nauru and other SIDS to address loss and damage. It is beyond our current national means to address loss and damage from climate change and financial flows from developed countries for addressing loss and damage in Nauru and other vulnerable developing countries should be new and additional to financing for those for mitigation and adaptation.

Mitigation

Mitigation Contribution	
Time Frame	2020 - 2030
Type of Contribution	Conditional Reduction based on identified mitigation actions To replace a substantial part of electricity generation with the existing diesel operated plants with a large scale grid connected solar photovoltaic (PV) system with an estimated cost of 42 million US$ which would assist in reducing the emissions from fossil fuels. Concurrent to the above there needs to be put in place extensive demand side energy management improvements with an estimated cost of 8 million US$ which will complement the PV installation. The demand management improvements are expectedto reduceemissions by bringing down diesel consumption further.

	The conditional mitigation contribution discussed above would require a total investment estimated at 50 million US$ including substantial technical, capacity building and logistical assistance due to the limited capacity on the island. <u>Unconditional Reduction</u> The unconditional contribution includes a secured funding of US$5 million for implementation of a 0.6 MW solar PV system which is expected to assist in unconditional reduction of CO_2 emissions marginally. This initiative will be used as a model project for the larger Solar PV plant and in addition assist in terms of technology transfer and institutional learning.
Type of Reduction	Being a Small Island Development State and a developing country with lowest total emissions in the world, Nauru's mitigation contributions are non-GHG targets through implementation of conditional and unconditional policies, measures and actions. Nauru also recognizes that mitigation contributions from developed countries may be absolute economy-wide emissions reduction targets relative to a base year while the developing countries can communicate policies, measures and actions departing from business as usual emissions.
Sectors	Sectoral (energy sector) commitment focussed on a transition to renewable energy in the electricity generation sector and energy efficiency through demand side management.
Gases	CarbonDioxide(CO_2)
BAU Emissions	The expected trajectory in emissions is highly uncertain due to paucity of reliable data and uncertainties in economic activities on the island. Contributing factors include both the small size of the economy and the uncertainty of phosphate extraction opportunities and the other recently commenced activities including offshore banking and housing Australian bound refugees. An extrapolation of trends in the last three years suggests economic growth of around 2.2% p.a. Of concern are high levels of expansion in the electricity sector with growth over the same period being around 13% p.a. Estimates, however, are that CO_2 emissions will increase from 57 kt p.a. in 2014 to close to 80 kt p.a. in 2030. The mitigation options are envisaged toassist in reducing CO_2 emission levels by 2030.It is important to note that the BAU emission estimates are not accurate due to substantial gaps in data for the sectors.
Methodology	The baseline, BAU and mitigation scenario assessments was done using best available historical data entered into the GACMO model which uses IPCC 2006 guidelines and conversion factors. Where data was not available default factors in the software were used.
Planning Process	Nauru's iNDC originates from a series of strategies, policies and assessments concerned with sustainability, environmental protection and energy supply developed or commissioned by the Government

	over the past decade. These include: National Sustainable Development Strategy (NSDS) 2005 – 2025 (revised in 2009), The Nauru Energy Road Map 2014-2020 and The Second National Communication (SNC) to the UNFCCC (submitted in 2015). Further, Extensive consultations with all relevant stakeholders were held during the preparation of Nauru's iNDC.
Fairness, Equity and Ambition	
Fairness, Equity and Ambition	Although a very small nationwith absolute levels of CO_2 eq emissions under 0.0002 % of world emissions(2014), Nauru wishes to play its part in the enormous challenge presented to the world by threat of global warming. In Nauru's case the threat is to its very existence. Nauru is also faced with serious economic challenges. Its once thriving phosphate industry has ceased operation thus depriving Nauru of its major lifeline revenue source. The local infrastructure, including power generation, drinking water and health services, has been adversely affected in recent years by the decline in income from phosphate mining. With fewer prospects in the phosphate industry, Nauru has to look at other alternative revenue sources to support its economic development. Unfortunately, for a country of the size of Nauru (21 km^2) with its limited natural resources, the options are not many. The global goal underlying the assessment of mitigation contribution is to reduce fossil fuel imports by using indigenous renewable energy and implementing energy efficiency measures. In light of the above, for such a remote island already severely damaged by phosphate mining, Nauru's mitigation contribution is quite ambitious. With regards to equity Nauru cannot be expected to mitigate out of its own resources and would need extensive international assistance.

NIUE

Intended Nationally Determined Contributions

Key messages

Niue's future is imperilled by the effects of climate change for which it bears absolutely no responsibility. Niue faces severe events and slow onset events from changes to the climate system caused by others.

Niue believes that loss and damage must be addressed in a sustainable and consistent manner to highlight its significance and relevance in climate change, especially in developing countries. It is beyond Niue's national measures to address loss and damage alone from climate change. Building on the Alliance of Small Island States (AOSIS) position, Niue is calling for loss and damage to be included as a separate element of the 2015 Paris Agreement, an element that should be distinct from adaptation.

Against a high climate risk backdrop, the objective of Niue's National Strategic Plan is to build a sustainable future that meets our economic and social needs while preserving environmental integrity, social stability, and the Niue culture. Much of the time and capacity of our small public service is put to devise and implement plans to build climate resilience and enhance our disaster preparedness. Donor support is critical to these efforts.

While Niue's contribution to global greenhouse gas emissions is negligible (less than 0.0001%), and Niue is a net sink given the growth of our forests, nevertheless we are taking steps to reduce our emissions, in particular in the energy sector. The Niue Strategic Energy Road Map (NiSERM) 2015-2025 outlines Niue's aspiration to meet 80% of its electricity needs from renewable energy sources by 2025, which would in turn reduce the country's high reliance on imported fossil fuel. Part of this goal can be achieved through national resources and identified assistance, but achieving such high levels of electricity from renewables (from around 2% today) is very ambitious and will need considerable contributions of financial and capacity support from our partners.

Section 1: Introduction

Niue has the distinction of being among the world's least populated nation states and with a future that is imperilled by the effects of climate change for which it bears absolutely no responsibility. In January 2004 the capital of Niue was destroyed by the category 5 Cyclone Heta. Niue knows the effects of severe events. It is also seeing the impacts of slow onset events as its underground freshwater lens faces contamination from rising sea levels.

Niue is a small Pacific Island Country (PIC) located partway between Tonga, Samoa and the Cook Islands. The island is approximately 259 km² with an Exclusive Economic Zone (EEZ) of 300,000km² and is reputedly one of the world's largest elevated coral atolls. The average height above sea-level is 23 metres and highest point less than 70m.

Niue is vulnerable to climate risks such as tropical cyclones (TCs) and droughts; geological risks such as earthquakes and tsunami; and human-caused risks such as disease outbreaks and contamination of its only fresh water supply. Niue's risk profile is also inherently linked to its isolation and limited capacity to manage and respond to disasters and climate change impacts. Traditional coping strategies have tended to make

way for an increased reliance on external support, as New Zealand fulfils its obligations to provide support to Niue in times of disaster.

Niue has no surface water and relies upon groundwater resources and rain catchments. Groundwater is recharged via rainfall infiltration and rainfall currently exceeds the rate of extraction. However, Niue's porous soil renders its underground fresh water vulnerable to contamination, from both human causes (e.g. agricultural chemicals) and natural sources (e.g. sea water). Agriculture is predominantly focused on subsistence production, principally of root crops. The combination of relatively poor soils and dependence on rainfall makes agricultural production highly sensitive to changes in rainfall frequency and amount.

Niue has a population of approximately 1500 (2013 census) spread across 14 villages. Large scale outward migration, usually from younger age groups, has occurred since 1971, predominantly to New Zealand for education, employment opportunities and family ties, as well as perceived higher standards of living abroad. As a result, there are over 20,000 people identifying themselves as Niuean that live in New Zealand.

Niue's economy is heavily dependent on support from New Zealand, which has a statutory obligation to provide economic and administrative assistance to Niue. Aid accounts for 70% of Niue's GDP, which is NZ$10,000 per capita. Other sources of financial resources include taxation, government trading activities, sovereign assets and additional support from development partners. Low population, scarcity of natural resources, isolation and high costs of transportation lead to Niue's economy being far from self-sufficient.

Climate change will exacerbate the already vulnerable situation in Niue outlined above. The most recent report from the Pacific-Australia Climate Change Science and Adaptation Planning Program (PACCSAP) provides the following future projections to 2100 for Niue:

- El Niño and La Niña events will continue to occur in the future (*very high confidence*), but there is little consensus on whether these events will change in intensity or frequency;
- Annual mean temperatures and extremely high daily temperatures will continue to rise (*very high confidence*);
- Mean annual rainfall could increase or decrease with the model average indicating little change (*low confidence* in this model average), with more extreme rain events *(high confidence*);
- The proportion of time in drought is projected to increase or decrease in line with average rainfall (*low confidence*);
- Ocean acidification is expected to continue *(very high confidence);*
- The risk of coral bleaching will increase in the future *(very high confidence);*
- Sea level will continue to rise (*very high confidence*); and
- Wave heights may decrease in December–March (*low confidence)*, with no significant changes projected in June–September waves *(low confidence)*.

In particular, climate change impacts are likely to further exasperate both freshwater lens and coastal water quality issues for Niue. For these reasons, protecting and enhancing natural resources, adequate sanitation and wastewater treatment are among the government's main priorities.

The risks climate change poses to Niue are therefore highly significant, and the ability of Niue to effectively respond to minimise or avoid these risks is minimal. Niue therefore must rely on the international community to avoid the dangers of climate change. This requires significant reductions in global greenhouse gas emissions so that climate is stabilised to allow Niue's natural and social systems to adapt, and partnerships are developed between Niue and more developed nations to implement effective and efficient adaptation responses.

Section 2: National Response

The draft Niue National Strategic Plan (2014-2019) has a vision of Niue ke Monuina – A Prosperous Niue. The objective is to build a sustainable future that meets our economic and social needs while preserving environmental integrity, social stability, and the Niue culture.

The achievement of Niue ke Monuina is supported by seven national development pillars and specific strategies under each of those pillars. Progress of the journey to prosperity is measured by targets and indicators corresponding to each of the pillars.

1. Financial Stability – Ensure that sufficient financial resources are secured, and responsible fiscal management is prudent, sustainable and supports healthy development strategies;
2. Governance – Ensure that good governance reflects the principles of transparency and accountability and is practised at all levels;
3. Economic Development and Maintain Crucial Infrastructure – support families, public services, and the private sector through tourism development with a safe, reliable, affordable healthy infrastructure;
4. Social – Enjoy a harmonious and healthy lifestyle in a thriving, educated and safe community that has access to a wide range of quality social services and healthy development opportunities;
5. Environment – Sustainable use and management of Niue's natural resources and environment for present and future generations;
6. Tāoga Niue – Promote, preserve and strengthen Niuean cultural heritage, language, values and identity;
7. Private Sector Development – Be a prosperous and skilled island nation underpinned by a thriving and entrepreneurial private sector.

While building resilience to climate change is not explicitly mentioned it is an integral part of Pillar 5, and is of fundamental importance to all seven national development pillars.

Section 3: Approach to Building Resilience to Climate Change

Within the context of the draft NNSP 2014-2019 the key guiding documents for building resilience to climate change in Niue are the National Climate Change Policy (2009) and Niue's Joint National Action Plan (JNAP) for Disaster Risk Management and Climate Change Adaptation (2012).

The Vision of the National Climate Change Policy is for a "Safer, More Resilient Niue to Impacts of Climate Change and Towards Achieving Sustainable Livelihood". The Policy Goal is "To promote understanding of and formulate appropriate responses to the causes and effects of climate change in support of national sustainable development objectives."

To attain this Policy Goal the following objectives have been identified along with associated Strategies:

1. Awareness Raising – To promote public awareness and improve stakeholder understanding of the causes and effects of climate change and climate variability and as well as on vulnerability, adaptation and mitigation responses;
2. Data Collection, Storage, Sharing, and Application – To improve and strengthen the collection, storage, management and application of climate data, including greenhouse gases and emissions, to monitor climate change patterns and its effects;
3. Adaptation – To develop effective adaptation responses and enhance adaptive capacity in order to protect livelihoods, natural resources and assets, and vulnerable areas to the impacts of climate change to all sectors;
4. Mitigation – To mitigate the causes of climate change and implement effective mitigation measures to reduce greenhouse gas emissions;

5. Governance and Mainstreaming – To mainstream climate change issues into national development; and ii) establish an effective regulatory and institutional framework to facilitate the development and implementation of national responses to climate change;
6. Regional and International Cooperation – To ensure Niue obtains maximum benefits from relevant international and regional instruments relating to climate change and that it meets its commitments under them.

In its commitment to building resilience, Niue has developed the Niue Joint National Action Plan (JNAP). The JNAP strongly recognises the links between disaster risk management and climate change action, and thus aims to operationalise the Climate Change Policy and vulnerabilities identified in the draft Second National Communication (SNC). The JNAP also fulfils meeting the task of operationalising the Coastal Development Policy.

The JNAP has the following goals:

Goal 1 – Strong and effective institutional basis for disaster risk reduction / climate change adaptation;

Goal 2 – Strong public awareness and improved understanding of the causes and effects of climate change, climate variability and disasters;

Goal 3 – Strengthened livelihoods, community resilience, natural resources and assets;

Goal 4 – Strengthened capacity to adapt renewable energy technologies, improve energy efficiency and energy security;

Goal 5 – Strengthened disaster preparedness for effective response.

Achievement of these Goals is through specific objectives and actions associated with these, which are fully costed for donor support.

Revision of the Climate Change Policy and JNAP will likely be required both before and post 2020 with costing of further identified activities for donor funding towards building a resilient Niue.

Section 4: Sector Policies and Plans

In addition to the NNSP and the Climate Change Policy there have been a number of recent policies which have integrated climate change considerations into the decision making process. These include the Forest Policy, the Niue National Energy Policy, and the Ecosystems Approach to Fisheries Management. Furthermore, a number of Government departments have incorporated climate change policies into their corporate plans, for example the Agriculture Sector Plan.

Other priority sectors for integration of climate change considerations into policies and plans include:

- Water Resource management
- Food security
- Climate Change Adaptation & Health Plan developed in 2013 by the Niue Health Department with donor partners
- Waste & sanitation management strategy for general, liquid and organic wastes
- Building Code Review, update, including development of national standards

Donor funding will be required to support development of relevant sector policies and plans, all of which will need to be developed, implemented & monitored to ensure full alignment with the goal of achieving climate resilience. All sector plans will also need to incorporate measureable indicators to align with the NNSP, and will need to be fully costed for donor funding.

By 2020, new sector plans will be required that are all fully costed for donor funding.

Section 5: Mitigation context

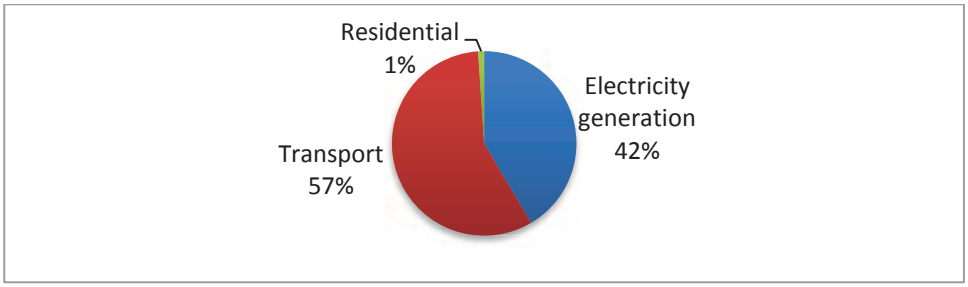
Niue is one of the world's least populated countries with low per capita emission of greenhouse gases. This means that Niue's contribution to this global problem is small, accounting for less than 0.0001% of global greenhouse gas emissions. Removals from Niue's forests outweigh its emissions many times over. As such, Niue is a net carbon sink, removing in the order of 139Gg CO_2-e from the atmosphere each year.

However, Niue recognises there may be considerable scope through technological and behavioural means to lower its emissions this further, congruent with Niue's ambition to be a globally responsible citizen. It is anticipated that mitigating greenhouse gas emissions can have substantial collateral benefits including: decreased national expenditure associated with the escalating costs of importing fossil fuels; improved energy security; improved local air quality; support for Niue as an eco-tourism destination and encouraging sustainable development in the Pacific region.

Efforts to reduce GHG emissions are complementary to Niue's focus on its vision to 'build a sustainable future that meets our economic and social needs while preserving environmental integrity, social stability, and the Niue culture'.

The sectoral breakdown of Niue's GHG emissions from the forthcoming Second National Communication (2009 data, excluding waste) shows that the vast majority of Niue's emissions come from the energy sector. As shown in Figure 1 below, transport contributes the bulk of energy sector emissions at 57%, and electricity generation the remainder, at 42%. The focus of GHG mitigation efforts for Niue is thus firmly on transport and electricity generation.

Figure 1: Breakdown of Niue energy sector GHG emissions (2009, Second National Communication)



In 2015, Niue has a 100% electricity penetration rate and total electricity demand is fairly stable, having recorded only 3% growth from 2008 to 2012. However Niue is 96% dependent on imported fuel for power generation and 100% dependent on imported fuel for land, sea and air transportation.

Electricity generation

Reliable, affordable, secure and sustainable energy supply is key to achieving prosperity for all Niueans. In light of Niue's vulnerability on imported oil, the Niue Strategic Energy Road Map (NiSERM) 2015 – 2025 was developed, with the goal of "a sustainable energy sector for a Prosperous Niue". The NiSERM builds on the 2005 Niue Energy Policy (NEP) and the Niue National Strategic Plan (NNSP) 2014 – 2019, to pursue five key motivations identified by stakeholders:

1. Reduced dependence on fossil fuels
2. Improved energy efficiency
3. More sustainable, cleaner energy
4. Improved cost-effectiveness of energy services
5. Attract funding for energy sector development

Niue is committed to transitioning the electricity sector from fossil fuel to renewable energy. The NiSERM outlines Niue's aspiration to meet 80% of its electricity needs from renewable energy sources by 2025, which would in turn reduce the country's high reliance on imported fossil fuel. This aspiration underpins Niue's contribution in this INDC, outlined in Section 6.

The period 2000-2009 saw progress on greenhouse gas emission mitigation in the form of the installation of solar hot water heating, public education campaigns, increased grid penetration and distributed use of renewable technologies, and the promotion of using low emission fuel sources and financial support for the uptake of more efficient appliances.

However, Niue faces difficulties in mitigating climate change for two primary reasons. First, Niue lacks environmental base data which would be able to support climate related decision-making. Second, Niue lacks the capacity to monitor and evaluate energy supply initiatives. Without this support there is no way to evaluate the cost or emission reduction effectiveness of programmes and take an adaptive management approach.

Recent installations of solar PV, identified as the most feasible renewable energy source for Niue, have seen grid stability issues arising that is inhibiting additional solar grid connections. The power sector in Niue urgently requires technical assistance to address this issue.

There are further issues in establishing a renewable industry in Niue. These are the high degree of subsidisation of electricity prices, a small market, high capital costs and lack of technological knowledge within the utility.

Transport

The majority of fuel use is for land transport and the other major fuel user is the airline industry. As international regulations limit scope for national interventions, Niue is focusing mitigation efforts on land transport.

There is no public transport system in Niue and therefore private vehicles are the primary mode of transport. There is currently no regulation that restricts the type of vehicles allowed into the country, however in 2011 Customs regulations were amended to encourage the import of fuel-efficient vehicles into Niue, and targets have been set under the NiSERM to deploy more fuel efficient vehicles.

Efforts are hampered by the limited availability of technological solutions for the transport sector. However, this may be changing with the emergence of electrical vehicles, that could serve to be a resource for electricity grid stability and a means of reducing oil dependence, providing solar charging as part of the path to a 100% renewable electricity grid. The Government welcomes international assistance in the development of opportunities for deep emissions cuts in the transport sector.

Land Use Change and Forestry

As mentioned, Niue is a net sink of greenhouse gases. It is important that the capacity of removals of greenhouse gases by AFOLU be maintained, if not enhanced. Currently, forestry activity is low and population decline has resulted in significant conversion of cropland to secondary rainforest. Removals can be assumed to be highly sensitive to future population increases, residential infrastructure replacement after cyclones or commercial forestry resumption. The Government of Niue is concluding a National Forest Policy to provide strategic direction for the island's forest areas.

Section 6: Mitigation contribution

COUNTRY: Niue		**DATE: November 2015**
Parameter		**Information**
Period for defining contribution (outcomes)		2020, 2025
Type and level of contribution		In line with Niue's resilience approach to reduce dependence on imported fossil fuels, Niue will achieve a 3**8% share of renewable energy of total electricity generation by 2020**. (In 2014 the renewable energy share was 2% and this contribution assumes assistance to address critical grid stability issues). This will in part be delivered by a 10% reduction in residential, commercial and government electricity demand by 2020. This contribution will be maintained out to 2025 and will be delivered using national resources and international assistance being identified to achieve the goals of the NiSERM. **Conditional upon additional international assistance**, Niue could increase its contribution to an **80% share of renewable energy of total electricity generation, or to even higher levels, by 2025.** This would require additional support for energy storage and renewable energy generation, and strengthened frameworks for project delivery. Specific actions to deliver the above contributions are outlined in Annex 1. While required investment to achieve the contributions has not been fully quantified, investments required are far smaller than those needed to deliver a resilient future for Niue in the face of climate change.
Estimated quantified emissions impact		In 2009 electricity generation contributed 2.1 Gg CO_2e as an emissions source. The NiSERM Business as Usual forecast predicts a 33% increase in diesel consumption for electricity generation from 2009-2020 and 75% increase by 2025, assuming economic and population growth and no GHG abatement measures. A 38% renewable energy contribution in 2020 would equate to a reduction of 364,000 litres of diesel per annum, or approximately 1.2 Gg CO_2e per annum. An 80% renewable energy contribution in 2020 would equate to a reduction of 977,000 litres of diesel per annum, or approximately 3.1 Gg CO_2e per annum.
Coverage	Sectors	Electricity (42% of reported 2009 energy sector emissions)*
	Gases	Carbon dioxide (CO2); Methane (CH4); Nitrous oxide (N2O)
	Geography	Whole country
Planning Processes		This INDC was prepared primarily using pre-existing national policy documents, and sector policies and plans to ensure accurate reflection of national development priorities, with pre-existing stakeholder support. The INDC was reviewed by key ministry representatives and formally approved by Cabinet.

* note that waste and agriculture sectors were not reported in 2009 GHG inventory.

Section 7: Statement on “Fair and Ambitious”

While Niue’s contribution to global greenhouse gas emissions is negligible (less than 0.0001%), and Niue is a net sink given the growth of our forests, nevertheless we are taking steps to reduce our emissions, in particular in the energy sector. The Niue Strategic Energy Road Map (NiSERM) 2015-2025 outlines Niue’s aspiration to meet 80% of its electricity needs from renewable energy sources by 2025, which would in turn reduce the country’s high reliance on imported fossil fuel. Part of this goal can be achieved through national resources and identified assistance, but achieving such high levels of electricity from renewables (from around 2% today) is very ambitious and will need considerable contributions of financial and capacity support from our partners.

Section 8: General caveats statement

The preparing of this INDC came during Niue’s development of its Second National Communication. As such, data on GHG emissions are provisional and therefore subject to revision. The Second National Communication, once completed, will provide a more comprehensive presentation of Niue’s circumstance, plans and needs.

While there is a relatively high confidence regarding data on fuel importation and consumption, data collection on other emissions sources is not yet developed sufficiently to make higher tier inventories possible.

To obtain a better picture of the AFOLU sector will require an accurate, quality controlled survey of land use status using up-to-date satellite imagery and GIS mapping. Waste surveys currently lack the sample size and coverage to be statistically meaningful.

Annex 1

Specific strategies, policies, plans and actions, including timing and support needs

The table below provides a summary of current priority items that Niue wishes to highlight as needing support or that are significant initiatives that the government will take from its own budget resources. Available information dictates that these relate narrowly to mitigation actions; however, the list will be expanded in future to include a more holistic set of priorities compatible with Niue's resilience building development strategy. The investments required to achieve Niue's mitigation contribution, while not fully quantified, are far smaller than those needed to deliver a resilient future for Niue in the face of climate change.

Item	Planned period of implementation	Conditional on additional support?	Support partner(s) identified?	Notes
Priority enabling activities:				
Resolve grid stability issues	2016	Yes	No	Crucial to integrate existing installed PV generation before increasing solar installations. Est. investment: $5.4m USD
Develop national capacity to monitor and evaluate energy supply and efficiency initiatives	2016-2020	Yes	No	
Advance land use change accounting through acquisition of recent, multi-spectral satellite imagery and relevant processing and verification	2016-2020	Yes	No	
Priority near-term activities:				
Investigation and implementation of renewable energy resources including additional solar PV, wind and assessing biofuel, biogas potentials	2015-2020	No	Partial	Funding to support resource identification secured. Requires investment for project implementation.
Build in-country capacity to operate and maintain renewable energy	2015-2020	No	Partial	Partial SPC funding identified, additional $0.07m USD investment required.

Item	Planned period of implementation	Conditional on additional support?	Support partner(s) identified?	Notes
Implement energy efficiency through supply side loss reduction, develop energy auditing, equipment standards and labelling, regulatory reform and fuel substitution for transport and cooking.	2015-2020	No	Partial	Funding to support resource identification secured. Requires additional $0.6m USD investment.
Efficient supply and storage for fuels and LPG and economics assessments on fuel supply and storage	2015-2020	Yes	Partial	SPC technical support identified. Additional $4.4m USD investment required.
Priority longer-term activities:				
Implement additional renewable energy generation capacity to increase RE share from 35% to 80%	2020-2025	Yes	No	If achieved through solar PV 1.8MW of additional capacity would be required by 2025.
Matching energy storage capacity	2020-2025	Yes	No	
Transport sector transition away from fossil fuels	2020-2030	Yes	No	Requires pre-feasibility work on electric vehicles, before broader implementation strategy as options become more commercially viable

NEW ZEALAND

Submission to the ADP

Addendum to New Zealand's Intended Nationally Determined Contribution

25 November 2015

New Zealand communicated its intended nationally determined contribution together with accompanying information on 7 July 2015.

New Zealand, through this submission, presents an addendum to its INDC to provide further clarity, transparency and understanding about its intended approach to accounting for emissions and removals from forestry and other land use in achieving our 2030 target.

NEW ZEALAND

Addendum to New Zealand's INDC: Forestry assumptions and methodologies

Approach to accounting for forestry and other land use	
Purpose of Addendum	The purpose of this addendum is to enhance the clarity, transparency and understanding of New Zealand's INDC by setting out the assumptions about accounting for anthropogenic greenhouse gas emissions and removals from forestry and other land use underpinning the INDC submitted on 7 July 2015.
Methodologies	New Zealand's accounting for forestry and other land use will be based on a combination of the 2006 IPCC Guidance and the 2013 IPCC Kyoto Protocol Supplement, providing for Kyoto Protocol accounting approaches to be applied to the GHG Inventory land-based categories. This approach recognises that accounting methodologies need to focus on anthropogenic effects, accommodate the specific biophysical characteristics of land use, and create efficient incentives for mitigation that can reconcile multiple sustainable land management objectives.
Forestry and other land use approach	New Zealand's forestry and other land use approach assumes accounting will be either land or activity based, and will apply existing IPCC methodologies to distinguish areas subject to direct human-induced change from those under pre-existing management, as follows: a. Forests established after the base year will continue to be accounted for as they would under the Kyoto Protocol, but once they attain their long-term average carbon stock, taking into account all carbon pools and activities, the forest will transfer to the Forest management/Forest remaining forest category, where it will be accounted for under a business-as-usual reference level. New Zealand will continue to account for all deforestation emissions. b. Forests established before the base year will continue to be accounted for under a business-as-usual reference level, as per the Kyoto Protocol, to address the dynamic effects of age structure resulting from activities and practices before the reference year, and the ongoing cycles of forest harvest and regrowth that occur as part of normal, sustainable forest management. c. Accounting provisions to address natural disturbance, land-use flexibility, legacy effects, non-anthropogenic effects and additionality since the base year will also continue to apply, building on existing guidance. Harvested wood products accounting will be based on the production approach. New Zealand's forestry and other land use approach builds on experience with accounting under the Kyoto Protocol to recognise and focus on additional action, and will create incentives for the establishment of new forests, recognise permanent, long-term enhancements of carbon sinks resulting from new management, and take responsibility for deforestation, while accommodating the long-term cycles in net emissions and removals that arise from sustainable forest management.

NEW ZEALAND

Republic of Palau

Intended Nationally Determined Contribution

November 2015

1. Introduction

The Republic of Palau is committed to the successful conclusion of negotiations under the Ad-Hoc Working Group on the Durban Platform for Enhanced Action (ADP) in order to adopt, at COP21, a new legally-binding agreement under the United Nations Framework Convention on Climate Change (UNFCCC) applicable to all Parties, to come into effect in 2020.

In accordance with decisions 1/CP.19 and 1/CP.20, the Republic of Palau is pleased to communicate its Intended Nationally Determined Contribution (INDC) towards achieving the objective of the UNFCCC, as well as accompanying information to facilitate clarity, transparency, and understanding of its INDC.

The Republic of Palau is also pleased to provide additional accompanying information on our mitigation effort and support for implementation.

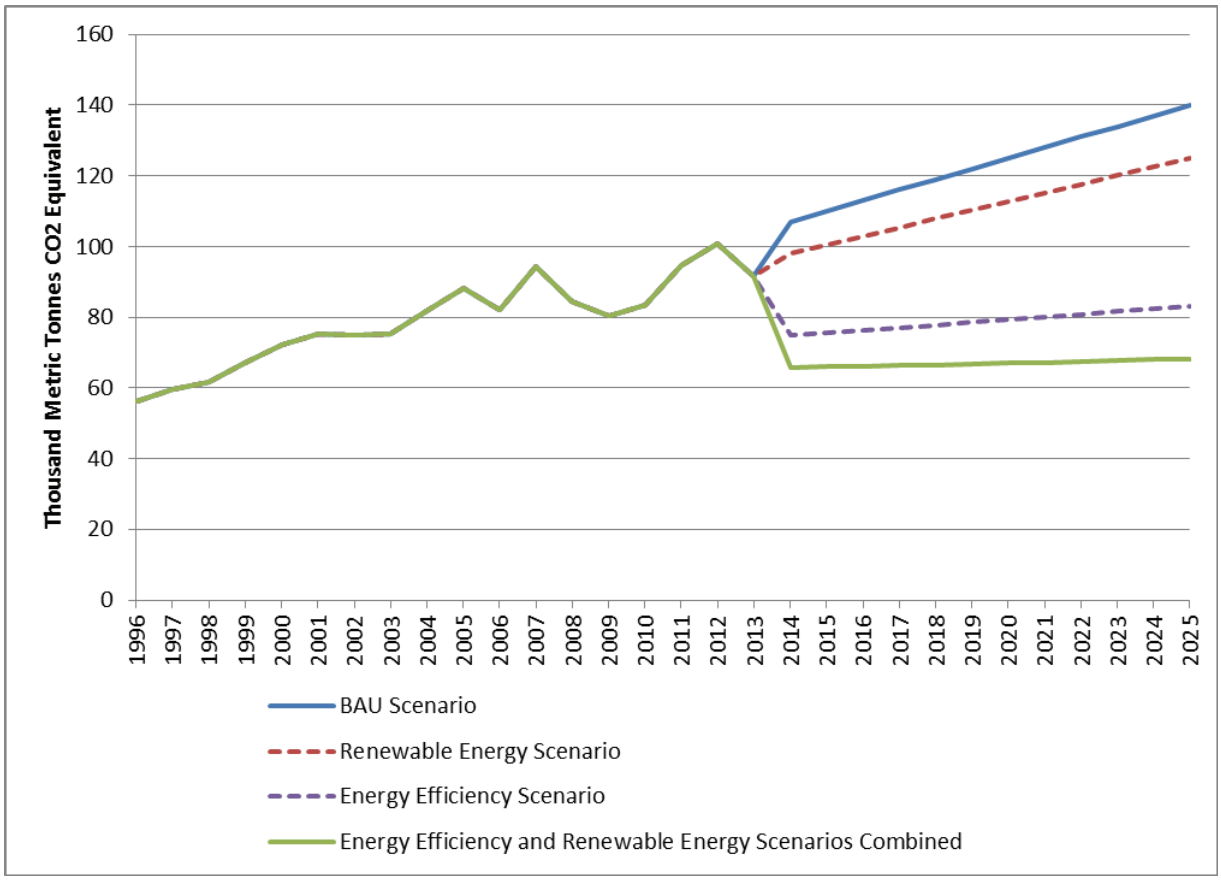
2. Intended Nationally Determined Contribution – Mitigation [Contribution]

Timeframe	Start year: 2020	End year:2025
Type of commitment	Absolute energy sector emissions reduction target, with additional reductions coming from the waste and transport sectors.	
Reference/base year	Reference/base year is 2005 – emissions were approximated at 88 thousand tCO2e	
Estimated quantified emissions reductions	Indicative targets: - 22% energy sector emissions reductions below 2005 levels by 2025 - 45% Renewable Energy target by 2025 - 35% Energy Efficiency target by 2025	
Coverage	Energy (electricity generation), transport and waste sectors	

	Gases: Carbon dioxide (CO2) and methane (CH4)
Baseline assumption	Business as Usual (BAU) emissions scenario projections are based on economic growth in the absence of new climate change policies and measures in addition to those in place in 2015, and greater coverage and implementation of existing measures. BAU projections include the electricity sector only, which is Palau's largest emitting sector. BAU assumptions include a GDP per capita growth of 3.72% per year (historical 15 year CAGR) and EIA oil price projections in reference case as the basis for residential, government and commercial sector energy use growth projections. Commercial energy use growth projections also took into consideration energy use by private generators in the tourism sector. Emission from the waste management and transport sectors are not included in the BAU projection however emission reduction initiatives will be addressed on a project basis.
Intention to use market-based mechanisms to meet target	No
Land sector accounting approach	N/A
Planning Process	Palau's INDC is grounded in the *Palau Climate Change* Policy, which was informed by input from communities, civil society and other stakeholders, as well as on the preparatory work for Palau's second National Communication which was also widely consulted. The *Policy* establishes Palau's National Appropriate Mitigation Actions (NAMA) and National Adaptation Plan (NAP) as well as the institutional and policy frameworks for: (a) climate change mitigation via management of greenhouse gas emissions including carbon sinks; and (b) climate change adaptation and risk reduction and management. It establishes the policy framework that will guide and inform action in accordance with Palau's *National Master Development Plan – Palau 2020.*
Fair and Ambitious	The Republic of Palau's total emissions are *de minimis* in the global context. Given Palau's remoteness, the small size of the economy, low GDP per capita, dependence on partnership support and vulnerability to climate change, Palau's proposed targets are ambitious and fair as measured against other nations. Under the BAU scenario emissions would be 140 thousand tCO2e in 2025, compared to 68 thousand tCO2e if both the renewable energy and energy efficiency targets are met.

	Emissions in 2005 were approximated at 88 thousand tCO2e. Full implementation of the renewable energy and energy efficiency strategies outlined below puts Palau on a trajectory to reducing emissions by half as against BAU in 2025, the equivalent of 22% under 2005 emissions levels.

Business-As Usual emissions projection against INDC full implementation emissions projection (and Renewable Energy and Energy Efficiency scenarios disaggregated)



3. Accompanying Information on Palau's INDC

a. General information on Palau

Palau is joining the community of nations, both industrialised and developing, in taking action to address the causes and impacts of climate change. Palau is particularly vulnerable to the impacts of climate

change, principally from sea level rise and the increase in extreme events (drought, flooding, Category 4 and 5 typhoons). Sea-level rise threatens vital infrastructure, settlements, and facilities that support the livelihood of island communities. Moreover, under most climate change scenarios, water resources in small islands are likely to be seriously compromised. Subsistence and commercial agriculture will be adversely affected by climate change, and ocean warming and acidification will heavily impact coral reefs, fisheries, and other marine-based resources crucial to our livelihoods, economy and culture.

b. Mitigation: Current and Future Policies and Measures to achieve INDC targets

i. Current Policies and Measures

Currently Palau is working to increase the share of renewables in our energy mix and to increase energy efficiency initiatives. To date, total renewable energy efforts have only reached 8% of the needed 22%, principally because two grid-connected solar projects (1.5 and 3.5MW respectively) never came to fruition. However to date Palau has achieved an approximately 30% reduction in energy use due to efficiency measures taken.

Current renewable energy and energy efficiency policies and measures include: a pilot loan subsidy for solar roof panels which will be increased to cover more homes if successful; a Home Energy Efficiency Program at the Palau National Development Bank; prepaid metering at Palau Public Utilities Corporation; distribution of CFL light bulbs; government building retrofits; and, a pilot Energy Audit program for large commercial buildings.

ii. Future Policies and Measures to achieve INDC targets

To achieve the renewable energy target Palau will need considerable additional installed capacity, including the 5MW of solar already planned (two or more solar projects plus additional roof-top solar) plus an additional 10 MW to power the water sector. Palau will also have to work to reduce transmission and distribution losses. (Solar Capacity Factor is assumed to be 15.3%.)

To implement the Energy Efficiency target, Palau will:

- Increase the Energy Retrofit Program;
- Institute a Tropical EE Building Code;
- Adopt the Energy Star Appliance Standard;
- Implement an Energy Labeling Scheme;
- Significantly expand our Cool Roof Program;
- Expand Energy Audit program to include all government and non-government buildings;
- Enhance the Building Managers Working Group; and
- Improve Wastewater Infrastructure.

Many of these renewable energy and energy efficiency initiatives will depend on the availability of partnership finance and technology support.

i. Additional project based initiatives in the transport and waste sectors

Reducing Methane Emissions from the Solid Waste Sector

- Palau has developed a "National Solid Waste Framework" but has not had funding to implement the planned actions. A key next step is to analyze landfill gas emissions and evaluate the potential for landfill gas capture projects at the national landfill site.

Transport Sector

- Currently there is a pending national legislation that would mandate the use and commercial sale of four stroke outboard motor engines only to reduce emissions.

- Palau is investigating a project to convert waste cooking oil to biofuel for diesel vehicles, beginning with public school buses and a potential public bus route.

c. Support for Implementation

Climate change presents a major challenge for Palau's sustainable development, for which the nation relies significantly on development partnerships. Similarly, as noted above, implementation of many of the policies and measures needed to achieve our emissions reduction target will depend on the availability of partnership finance, technology support and capacity development.

Based on a first-order estimate, the upfront investment cost for the renewable energy and energy efficiency measures in Palau's INDC would be on the order of $5.5 million USD. This investment has the potential to generate savings, on a net-present-value basis, of $2.5 million by 2025. This figure doesn't show the full picture of potential returns on investment though, as there was not sufficient data to assess the energy efficiency savings which have the potential to be substantial.

PAPUA NEW GUINEA

Intended Nationally Determined Contribution (INDC) Under the United Nations Framework Convention on Climate Change

Summary

Papua New Guinea (PNG) has both very low absolute emissions and relatively low per capita emissions. The nation is, however, committed to also be a responsible global citizen contributes meaningfully to the reduction of global emissions by transitioning to a low carbon economy.

PNG shares the deep concerns of its nearby Pacific Island neighbours in terms of existential threats to some of the more vulnerable low lying countries. In addition there are the same existential threats to coastal and low lying areas of PNG itself.

From a historical perspective, PNG's greenhouse gas (GHG) emissions have been negligible and the state of the economy is such that the main burden for any mitigation undertaken by the country must be the responsibility of the developed countries that have been primarily responsible for the bulk of the world's emissions.

The primary mitigation effort of PNG lies in reducing emissions from land use change and forestry. PNG can contribute to addressing the global mitigation gap by reducing deforestation and promoting forest conservation and sustainable management of its forests. The main forestry effort will be coordinated though the existing REDD+ initiative.

However, PNG 's current economic development is seeing a growth in fuel use therefore a big effort will be to reduce fossil fuel emissions in the electricity generation sector by transitioning as far as possible to using renewable energy. The target in this respect will be 100% renewable energy by 2030, contingent on funding being made available. In addition PNG will improve energy efficiency sector wide and reduce emissions where possible in the transport and forestry sectors. The main forestry effort will be coordinated though the existing REDD+ initiative.

In summary PNG is committed to assist in global mitigation efforts but the country's effort will be contingent on external, adequate and predictable funding being made available. In addition it is likely that in the near term GHG emissions will need to rise with economic growth to enable severe developmental problems to be resolved.

PNG's National Circumstances

Papua New Guinea (PNG) is the eastern part of the world's second largest island land mass in the tropical West Pacific. It is one of the more undeveloped regions in the world with low per capita incomes and serious health and social problems. A large proportion of its 7 million plus population live a lifestyle that has remained little changed for millennia, with extremely low use of fossil fuels and GHG emissions. In the last decade or two the situation in PNG has been changing and there has been considerable physical infrastructure development in the main urban areas due to proceeds from the development and sale of the country's rich natural resources, including minerals and oil and gas. There have been, however, significant challenges in managing and utilizing these resources sustainably and ensuring that suitable sustainable development goals and plans are in place to guide the needs of the present without comprising the ability of the future generations to meet their own needs. In terms of climate change, the growth in the PNG economy has produced a concurrent increase in GHG emissions, as also seen in countries the world over.

National development goals and context

In October 2009, the Government launched a 40 year development strategy: PNG Vision 2050. The intention is to transform the nation's mind-set and attitude and align the people, institutions and systems into educated, healthy and prosperous society. The vision stresses the importance of engaging the community into the process of building a strategy for sustainable development for all. Vision 2050 is underpinned by seven Strategic Focus Areas:

1. Human Capital Development, Gender, Youth and People Empowerment;
2. Wealth Creation;
3. Institutional Development and Service Delivery;
4. Security and International Relations;
5. **Environmental Sustainability and Climate Change;**
6. Spiritual, Cultural and Community Development; and
7. Strategic Planning, Integration and Control

The current theme of this new development road map is to shift the country's socio-economic growth away from the current emissions-intensive growth strategy towards a more sustainable path that is able to leverage PNG's competitive advantages, natural wealth and significant human capital into the future.
Foreign direct investment in the mining sector has increased significantly in recent years which have provided direct benefits including job opportunities to local Papua New Guineans. As the economy comes to rely more heavily on resource extraction, policies will be put in place to ensure that the benefits of growth are shared widely to reduce poverty and regional inequality, and promote sustainable development.

In May 2015 the PNG Government passed the Climate Change Bill to become the first nation in the Pacific region to implement a law that will, among other things, minimise the effects of climate change as a result of infrastructural development.

PNG's Mitigation Contribution

Existing National GHG Emissions and BAU projections of GHG emissions

The mitigation options for PNG are based on previous reports including the draft Second National Communication to the UNFCCC (SNC), third party reports and various national development plans.
The APEC energy supply and demand outlook 2009 gave the total primary energy supply in 2005 as a little under 2 MTOE which would give a CO_2 emission level of around 6 Mt CO_2 as of that year. 2010

CO_2eq emissions were estimated from earlier reports including the draft SNC to be around 5 Mt tonnes (from a primary energy supply of 1.8MTOE) which would give a per capita emission level of around 0.7 tonnes compared to the world average of just under 6 tonnes. It is likely, however, that the previous PNG figures do not include emissions from the indigenous oil and gas production sector. The growth of this sector in recent years has produced additional emissions which are likely to be around 5 Mt per annum (0.8 Mt Oil Search, 3.2 Mt Exxon Mobil, and 1 Mt other, including mining) as of 2014. The total would give around 10 Mt CO_2eq. This would give per capita emissions (2014) of around 1.4 tonnes per person per year which is still low by world standards. As noted there is considerable uncertainty in these estimates as the figures given in the draft SNC are under revision for the final document.

In addition, the draft SNC report reports the PNG forestry CO_2 emissions (FOLU) as 413 Gg for 1994 and 2199 Gg for 2010 or around 2 Mt for 2010. It was noted in the draft SNC that forestry removals are estimated to vary considerably from year to year. Due to the uncertainty in forestry emissions, waste emission and agricultural emissions the numbers reported in this INDC document do not include these sectors. Emissions from the forestry and agriculture sectors are expected to rise concurrently to national economic growth, as demand increases for forest and agricultural commodities – fuelled by both domestic and international markets, and demands of the rural populace put increasing demands on the forest for food, fodder, fuel and building materials.

Gases considered

The paucity of reliable data at the present time regarding emissions suggests that PNG limit the gases considered to CO_2 only, except for the indigenous oil and gas production sector where CH_4 is also included in the industry calculations.

Expected trajectory

Projections of emission levels are difficult to make as they are likely to be dominated by changes in the mining, oil and gas sectors. Estimates are optimistic in terms of the gas sector exporting LNG with predictions of a doubling of capacity in the near future. LNG production is very energy intensive and will incur a concurrent increase in emissions. According to the Asian Development Bank (ADB), "New gas exports (LNG) are forecast to drive a growth surge to 15.0% in 2015 that will subside to 5.0% in 2016. In contrast with mining and petroleum, the rest of the Papua New Guinea economy is projected to grow by a more modest 4.0% in both years."

Longer term national economic projections suggest emission increases at around the 3-4% level per annum, meaning that the 2014 emission level of 5 Mt per year could increase to around 8 Mt per year by 2030. A doubling of oil and gas sector emissions would produce some 10 Mt of additional CO_2 eq. emissions by the same date but the actual figure would depend on the extent of economically extractable oil and gas reserves, which are not well documented.

Thus with BAU CO_2 emissions in 2030 could reach 18 Mt CO_2 per year (including CO_2 eq in the oil and gas sector only).

Assumptions and methods for establishing BAU emissions

The method for establishing BAU emissions has included examining past reports including the draft SNC with cross checks to stakeholder information including Government and private sector sources.

Mitigation opportunities

Immediate mitigation opportunities for PNG are extremely limited if economic growth progresses at current rates and the oil and gas sector expands as anticipated, other than in the forestry sector through the implementation of REDD+ activities, in the context of adequate and predictable support. The main opportunities exist in the electricity supply sector, energy efficiency, transport and forestry. The key technologies for mitigation are renewable energy deployment technologies in the electricity sector. Considerable assistance will, however, be needed in terms of human resource development and institutional support, technology transfer and capacity building in order to carry out the mitigation measures.

Electricity supply: PNG has a number of opportunities to transfer a proportion of its electricity generation to renewable options. In this regard the relatively high installed capacity of hydro of around 200MW presents itself as a large scale storage facility for intermittent renewable inputs to be fed to the main Port Moresby grid. In addition there are opportunities for additional hydro throughout the country. There is also geothermal potential, with 56 MW installed (2010) and 22 TWh/annum possible, albeit mostly in remote areas. PNG also has considerable biomass resources although there are indications of overexploitation of natural forests and harvesting of these will affect land use emissions in the forestry sector. Any final balance needed to achieve close to 100% renewables could be filled using solar PV.

Energy efficiency: has also been identified as a relatively low cost easily implemented option but, however, one that has not been seriously implemented in the country for various reasons including financial constraints. Energy efficiency will become more important as higher cost renewable resources are employed.

Transport: The number of motor vehicles in PNG has been increasing in recent years along with economic development in the main urban centres. The increasing social preference for individual transport is likely to limit mitigation options in the transport sector in the near future.

Forestry: PNG has extensive forest areas which present opportunities for mitigation. In the past rapid exploitation of these forests by uncontrolled logging and land use conversion to agriculture has produced increased FOLU emissions. PNG has been a global leader in the promotion of a mechanism to provide incentives to developing countries for the reduction of emissions from deforestation and forest degradation through the UNFCCC, and has been building national and regional capacities to implement REDD+ activities since 2009. PNG is assessing its drivers of deforestation and will develop a national REDD+ strategy over the next two years that will including specific policies and measures to implement REDD+. The policies and measures will aim to reduced emission from deforestation and forest degradation, as well as support sustainable management, conservation and enhancement of forest carbon stocks, thereby leading to enhanced removals from the forestry sector.. A key current shortcoming is the lack of data on forestry emissions and removals, which is currently being addressed through national assessments of land use change and the implementation of a national forest inventory. Data for forestry emissions will therefore be forthcoming in the next few years, which will allow a more accurate estimation of the potential emissions reductions and enhanced removals that PNG can achieve in its forestry sector through REDD+ implementation.

Methodology and assumptions

The methodology used for calculating emissions has been to identify the drivers of carbon emissions in various sectors and estimate the annual GHG emissions from each activity. In accordance with IPCC guidelines, emissions from shipping, aviation and the burning of fossil fuels that are exported have not been included.

For future reports on land use, land-use change and forestry (LULUCF) activities, a net approach will be used (in line with IPCC guidelines). PNG will be using the IPCC 2006 guidelines to estimate emissions and removals for all sectors.

In terms of the methodology to estimate emissions into the future to obtain a BAU scenario to the year 2030 it can only be estimates in terms of existing economic and population growth patterns. Population growth is high and around 2.7% pa. Economic growth is also high in the formal sector and dependant on the resource production sectors in mining and oil and gas.

Options for Mitigation contribution for INDC

Time frame for contribution

Due to the lead times in terms of technology transfer, capacity building, infrastructure development required, modelling and detailed costing of projects a 2020 – 2030 timeframe is put forward.

Mitigation contribution

The main mitigation contribution for PNG would be in terms of an indicative replacement of fossil fuelled electricity generation with renewable energy sources. This could be accomplished at a rate determined by the availability of external funding.
Due to the difficulty in accounting for actual emissions and the difficulty of large scale mitigation in the transport and land use sectors PNG will opt for a national target in the electricity sector in terms of becoming carbon free by a 2030 target date. This option has been explored both in official PNG Government policy and also by external third party reports such as the recent ANZ report (August 2015). In this regard there are many options in terms of PV, geothermal, biomass fuelled plants and additional hydro which could be investigated. Together these could make the country close to 100% renewable in the power sector. Longer term increases in energy consumption would, however, have to be restrained and ameliorated by extensive energy efficiency options.

Energy Efficiency options: Energy efficiency and conservation is always a good mitigation opportunity but would require external funding and assistance. Even though energy conservation and the use of renewable energy may save money in the long term, higher up-front costs have often prevented their use in the past.

Improve data gathering and human resource capability. PNG would like to vigorously pursue mitigation options in the future; however, considerable assistance will be needed in terms of capacity building and technology transfer for emissions data collection and tracking mitigation progress. Without improving national capacities in this area there is a high likelihood that regulation of the government and the private sector in terms of emissions will not be effective.

Oil and Gas sector: This sector is a generator of jobs and national economic growth and consequently considerable capital is being spent on developing this sector. Unfortunately the sector is responsible for considerable emissions and if the world does mitigate climate change seriously the production situation may change dramatically and the capital expended in the sector may become a stranded asset. While this change is unlikely to happen before 2030, if the world does follow mitigation strategies that reduce all fossil fuel use to zero, as required by IPCC AR5 RCP 2.6, there will of course be no market for hydrocarbons after 2050.

Transport: Transport will continue to be a significant emitter of CO_2 and mitigation needs to be seriously addressed. Options include improving public transport by introducing energy efficient busses in the main urban centres, and the future introduction of infrastructure for more sophisticated modes of public transport, such as trains and trams.

Forestry/land use: PNG will implement REDD+ activities under the UNFCCC to reduce emissions and enhance removals from this important sector, which PNG has set as a priority, as can be seen from its creation of a REDD+ Directorate within the Office for Climate Change and Development (OCCD). Extensive capacity building, technology transfer and technical assistance is required to implement effective actions and ensure the collection of accurate data.

Domestically financed contribution

Little domestic finance is available but Government assistance will be provided where possible. Private finance could be made available especially for the mining and oil and gas sectors. Energy efficiency initiatives could be encouraged by policy decisions.

Internationally supported contributions

The transition to renewable energy in the electricity sector thus would need to be mostly financed from external sources. The first step would be to quantify the funding needed and work with PNG Power to finalise a plan that would fit into the existing main grids.

Financing for the implementation of REDD+ activities under the UNFCCC are currently being supported by the UN-REDD Programme, the World Bank's Forest Carbon Partnership Facility (FCPF), and the European Union. These lines of support focus on REDD+ readiness and data collection. Further international financial support will be required for effective national scale REDD+ implementation.

Means of Implementation for supported Mitigation Contribution

The GoPNG has the Climate Change Act to implement the contribution together with sectoral agencies

Tracking and Monitoring Progress

Sectors and gases covered- Electricity sector for targeted reductions. Forestry to be covered under REDD+, Gasses: Carbon Dioxide only.
Accounting Methods for tracking the mitigation contribution (e.g., for economy wide reduction below BAU, based on GHG inventory developed using, say, tier II; for EE goal it would be approach to measure EE gains and estimation of GHG impact; etc.
The GoPNG will use IPCC Guidelines and sectoral accounting methods to track contributions.
The greatest challenge in terms of tracking and monitoring progress is to put in place robust measures for data collection. Existing systems and institutions will be built on to create adequate national capacities for carrying out these tasks, if adequate and predictable support can be sourced to support these efforts.

MRV approach for mitigation actions

The national measurement, reporting and verification process in place will cater for the monitoring of the INDC activities.

Equity and Ambition

Papua New Guinea is a developing country that has not been responsible for most of the GHG emissions of the world. In addition it still faces multiple development challenges. Of the country's approximately 7 million people, over 90% are employed in the informal sector and live an almost

entirely sustainable fossil fuel free existence. Domestic and international surveys reveal widespread illiteracy, malnutrition, poor health and vulnerability to natural hazards, many of which will become more salient with climate change. In terms of equity PNG cannot be expected to mitigate out of its own resources and would need considerable international assistance.

Adaptation

While there is considerable attention in terms of mitigation to keep the world average temperature increase below 2 degrees Celsius and effort in the Pacific Island countries to limit this increase to below 1.5 degrees Celsius the scientific opinion expressed in the latest 2014 IPCC AR5 reports suggests otherwise. In this respect adaptation must be a high priority for PNG.

The natural environment already poses significant risks to Papua New Guinea today; hazards like coastal flooding, inland flooding and droughts take a severe toll on the people and the economy. Climate change are predicted to exacerbate some of these event-driven hazards and may also introduce new hazards due to gradual shifts in climatic conditions – most prominently, increased malaria penetration in the highlands, changed agricultural yields and damaged coral reefs.

Throughout the country, natural disasters driven by climatic conditions (i.e., excluding seismic and volcanic activity) as well as gradual shifts in climatic conditions disrupt daily life, cause damage to assets and infrastructure, destroy livelihoods, endanger cultural and ecological treasures, and kill or injure people. Adaptation is included because it gives reports on specific activities, national projects, targets, objectives and goals on adaptation by identifying, coordinating and monitoring projects that supports specific adaptation solutions that protect people against the risk of climate change. The government of Papua New Guinea through the Office of Climate Change and Development has put its emphasis on identifying the specific nine (9) hazards prevalent in Papua New Guinea.

1. Coastal Flooding and Sea Level Rise
2. Inland Flooding
3. Food Insecurity caused by crop failures due to droughts and inland frosts
4. Cities and Climate Change
5. Climate Induced Migration
6. Damage to Coral Reefs
7. Malaria and Vector Borne Diseases
8. Water and Sanitation
9. Landslides

In the National Climate Change Development Management Policy the Adaptation Strategies, Risk Management has been prioritised and quantifying and prioritising hazards is one of the key activities of the strategies as given above.

Summary of needs for adaptation

In summary PNG is highly vulnerable to the effects of climate change and given the temperature increases locked in by present world emissions of greenhouse gasses, adaptation is a high priority. The country will need financial support, capacity building and technical support to face the uncertain future posed by climate change.

Samoa's Intended Nationally Determined Contribution

SEPTEMBER 2015

EXECUTIVE SUMMARY

The Independent State of Samoa is committed to combating climate change, and to the success of the negotiations for a new legally binding agreement under the United Nations Framework Convention on Climate Change at COP 21 in Paris.

Samoa is a small island developing state in the Pacific that is highly vulnerable to the impacts of climate change. However, it is only responsible for an insignificant amount of global greenhouse gas emissions. Despite this fact, Samoa is committed to addressing issues associated with climate change including adaptation and mitigation measures.

Pursuant to relevant sections of decisions 1/CP.19 and 1/CP.20 of the United Nations Framework Convention on Climate Change, Samoa hereby presents its Intended Nationally Determined Contribution as well as information to facilitate the clarity, transparency and understanding of the contribution.

Samoa is committed to reducing its GHG emissions from the Electricity sub sector through the adoption of a **100% Renewable energy target for electricity generation through to the year 2025.**

Samoa's commitment is conditional on reaching the 100% renewable electricity generation target in 2017 and receiving international assistance to maintain this contribution through to 2025.

Economy-wide emissions reduction conditional on external international assistance.

Samoa recognizes that achieving this highly ambitious target will require significant efforts to removing existing barriers. These include increases in human capacity, technology and capital investment.

1. INTRODUCTION: CONTEXT AND NATIONAL PRIORITIES

Samoa, a small island developing state in the South Pacific is at the forefront of efforts to address issues associated with the impacts of climate change. Like other islands in the region, the impacts of climate change on the environment are already quite evident and will continue to pose significant threats in the future.

On a global scale, Samoa's contribution to Greenhouse Gas (GHG) emissions are negligible as highlighted in its Second National Communication (SNC) and second GHG Inventory, 2007[1]. Total emissions for the year 2007 was estimated at 352,034 tCO_2-e or about 0.0006% of 2004 global GHG emissions (IPCC, 2007). However, despite the low contribution to global emissions, Samoa is ramping up its efforts to reduce its GHG emissions and demonstrate to the global community the actions being undertaken by a small and vulnerable country to address climate change.

Samoa has demonstrated significant commitment to addressing climate change by establishing a target of generating 100% of its electricity from renewable energy sources. This commitment is proposed to be implemented over two time periods. The first target is to reach 100% renewable electricity generation by the year 2017. The second target is to maintain this 100% contribution through to 2025 in anticipation of the increasing electricity demand.

The Strategy for Development of Samoa (SDS) highlights the key strategies for development across the priority sectors. The overarching theme for the SDS 2012 – 2016 is *Boosting productivity for sustainable development*[2]. The SDS highlights the importance of the environment as a priority area and has identified the mainstreaming of climate change across all sectors and increased investment in renewable energy as some of the main strategic outcomes. This political commitment to mainstream climate change issues is driving a number of actions that are aimed at not only adapting to the impacts of climate change but also accelerating efforts to reduce GHG emissions. The focus of Samoa's INDC is on mitigation given the short timeframe to prepare the report and carry out comprehensive stakeholder consultations. It is intended that this document will be a living document to be revised and updated when necessary.

Samoa is one of the most vulnerable countries to the impacts of climate change and some of these effects are already being felt across the country. Ongoing and planned activities are targeted at building resilience, disaster risk reduction and adapting to the adverse effects of climate change. Some of these adaptation measures are also expected to have mitigation potential.

[1] Samoa's Second National Communication to the UNFCCC, 2007
[2] Strategy for the Development of Samoa 2012 - 2016

Samoa's Intended Nationally Determined Contribution		
Period for defining actions & Reference Year		The target year is 2025 measured against the base year of 2014. Implementation period 2015 - 2025
Type and level of commitment		Samoa is targeting the Energy Sector with a focus on the Electricity sub sector. 26% of electricity was generated from renewable energy sources in 2014. Samoa commits to generating 100% of its electricity from renewable energy sources by 2025. This is conditional on Samoa attaining this target in 2017 and receiving external assistance to maintain the contribution of renewable sources at 100% through to 2025. Assistance required to reach this target include human, technological and financial resources. Further economy-wide emissions reductions are conditional on Samoa receiving external financial assistance from the international community.
Estimated, quantified emissions impact		In 2014, ~55,065 tCO_2-e of Samoa's GHG emissions were from the electricity sub sector. (Estimates of GHG emissions were based on methodologies used in 2nd GHG Inventory, Second National Communication and IPCC 2006 Guidelines)
Coverage	% National emissions (as at 2015)	The electricity sub sector accounted for ~13% of total GHG emissions in 2014 assuming business as usual scenario in all sectors since 2007. (IPCC 2006 Guidelines)
	Sectors	Energy
	Gases	CO_2
	Geographical boundaries	Whole country
Intention to use market based mechanisms to meet commitments		Samoa currently uses no market mechanisms but is willing to pursue the potential of markets where possible.
Land sector accounting approach		Not Applicable

Planning Processes	This INDC was prepared using a targeted approach whereby key stakeholders from the energy and climate change sector were consulted to provide the necessary information for compiling the report. The short timeframe allocated for the development of Samoa's INDC did not allow for a comprehensive national consultation process. However a substantial amount of work has been done at the national level in the energy sector and has helped facilitate the formulation of Samoa's INDC.
Fairness and Ambition	Samoa's Second National Communication and GHG Inventory highlighted the insignificantly low contribution of its emissions to the global aggregate. However, Samoa recognizes the potential for reduction of its emissions to not only support global efforts and demonstrate its willingness to address climate change issues but also to support the government's development vision of improved quality of life for all. As a small island developing state in the Pacific, Samoa faces the immense challenge of dealing with the adverse effects of climate change. This is made even more difficult by the fact that it has limited financial, technical and human resources. In setting itself a target of generating electricity from 100% renewable sources, Samoa has set a highly ambitious and fair target to demonstrate its commitment to reducing its emissions.
Methodology	This INDC was prepared using IPCC 2006 Guidelines and GHG Inventory has been updated using latest available data. Key assumptions and drivers are highlighted in Samoa's 2nd National Communication with BAU projection based on continuing economic and population growth with no GHG abatement measures.

2. SAMOA'S MITIGATION CONTRIBUTION

Samoa is committed to reducing its greenhouse gas emissions and at the same time pursue a low carbon emission development pathway which would have significant economic benefits.

The Energy sector which accounted for 50% of total GHG emissions in 2007 is targeted for emissions reductions in this INDC and in particular the electricity subsector (Figure 1). The National Energy Coordinating Committee[3] which is the key decision making body in the energy sector has set a target for Samoa to generate 100% of its electricity from renewable sources by

[3] The National Energy Coordinating Committee is a high level committee chaired by the Prime Minister and comprises key Cabinet Ministers and chief executive officers of ministries and agencies in the energy sector.

2017. This ambitious target is supported by a combination of policy level actions and development projects.

In 2007 total emissions from the electricity subsector were 44,214 tCO_2-e and represents emissions from diesel-fuelled thermal plants. Renewable energy contributed 48% of total electricity requirements in 2007. However, by 2014, renewable energy sources including solar photovoltaic, wind and hydropower contributed only 26% of total electricity generation. This drop in renewable energy contribution was due to the reduction in hydropower contribution when 3 of the hydropower plants were destroyed by Cyclone Evan. This highlights the vulnerability of Samoa to extreme climatic events which are expected to be more frequent as a result of climate change.

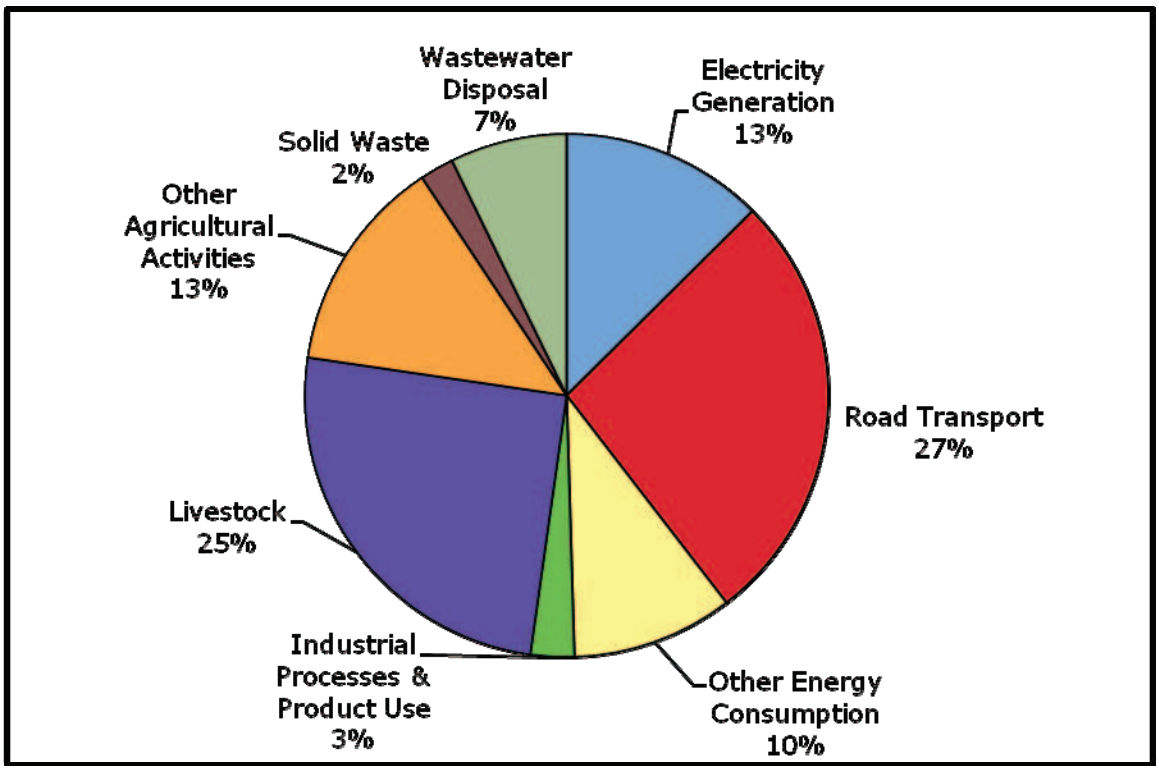


Figure 1: Samoa's sectoral GHG emissions (GHG Inventory, 2007)

The energy sector in Samoa is heavily reliant on imported fossil fuels to meet its needs. As the population grows GHG emissions are also expected to increase. Transportation and electricity generation are the two main contributors to emissions in the sector with the electricity sector contributing around 13% in GHG emissions in 2007.

Historically electricity generation has relied on two main sources, hydro and diesel-fuelled thermal power plants. Climate variability and oil price volatility have impacted electricity services in the past. Cyclones and other natural disasters have restricted the contribution of hydro power to the energy mix and in 2012; the destructive Cyclone Evan destroyed 3 of the 5 hydropower plants thereby reducing the capacity of this renewable energy source to the overall energy mix. In light of this and with a commitment to ensure energy security and reducing the

impacts of electricity generation on the environment, Samoa has taken steps to promote the use of renewable energy sources to displace fossil fuel for electricity generation.

KEY POLICY ACTIONS

An essential element to the realization of Samoa's commitment to climate change mitigation is having a favourable policy environment in place.

The *Samoa Energy Sector Plan 2012 – 2016* is a key guiding document for the energy sector with a theme of "sustainable energy towards energy self sufficiency". The Energy sector plan sets out a plan to deliver outcomes consistent with the Strategy for Development for Samoa with an overarching goal of increasing energy self sufficiency.

The *Electricity Act 2010* introduces key regulatory changes which have allowed the private sector to be involved in generating electricity and selling it back to the utility. This has allowed independent power producers (IPPs) to build and operate renewable energy power plants and sell electricity to the grid.

Other key policy drivers include the Greenhouse Gas Abatement Strategy, Climate Change Policy 2007 and the draft Energy Efficiency Act.

CAPITAL PROJECTS

Samoa has already undertaken and implemented a range of mitigation projects in the energy sector. These projects include various renewable energy projects for electricity generation as well as energy efficiency projects aimed at both supply and demand management. A combination of both renewable energy projects and energy efficiency measures is necessary to achieve the target as set out in the INDC. Significant donor assistance through grant financing has enabled the implementation of many of these projects. Future projects will need similar financing support.

Some of these projects include:

- Grid connected solar photovoltaic projects with a total installed capacity of 6MWp as of September 2015. This is a combination of both utility owned projects and IPPs and total capacity is expected to increase over the next couple of years;
- Wind Power - 550kW of installed capacity;
- Hydro Power – rehabilitation of 3.5MW hydro power plants destroyed by Cyclone Evan in 2012 as well as additional small run-of-river schemes;
- Bioenergy – 12MW of various projects aimed at utilizing biomass, biogas or alternative bioenergy source for electricity generation to be implemented by IPPs.
- Energy Efficiency – Projects aimed at controlling the importation of energy inefficient appliances such as product and labelling standards, retrofitting older and less efficient light bulbs with more efficient alternatives in the residential sector and other demand side management programs.

3. **ADAPTATION**

Samoa recognises that the adverse effects of climate change will have significant impact on the country particularly in sectors such as agriculture, coastal infrastructure, health, forestry, meteorology, tourism, and water. These sectors were prioritized in the National Adaptation

Programme of Action (NAPA)[4] and adaptation projects in these sectors have been successfully implemented with external financial support. While the focus of Samoa's INDC is on Mitigation, Samoa highlights the need to build on work that has been undertaken to ensure actions that have been identified during the implementation of previous adaptation objects are addressed at a future stage.

The effects of climate change and climate variability in the short and long term will continue to impact Samoa and through the implementation of some of the adaptation projects, emissions reductions are also possible. As with mitigation activities, implementation of adaptation projects are heavily dependent upon external financial assistance from the international community. Building climate resilience, disaster risk reduction as well as adaptation projects in vulnerable sectors require significant external assistance and this has been highlighted through the prioritisation of climate change in national planning.

4. SUPPORT FOR IMPLEMENTATION

Samoa has relied heavily on external assistance to fund many of its renewable energy initiatives. While the introduction of IPPs has transferred some of the financial burden of capital investment onto the private sector, the government is still faced with the task of improving existing transmission and distribution infrastructure.

As the country moves towards a more diverse mix of generation technologies, more investment is needed to upgrade and maintain existing infrastructure. The use of intermittent technologies such as solar photovoltaic and wind also puts pressure on the grid to maintain stability of supply. Storage and grid improvements become a priority once all these projects are online which are also capital intensive. To meet the target as set out in the INDC, Samoa needs financial assistance from donors and development partners to implement proposed renewable energy projects and also improve the existing infrastructure and technologies.

Substantial progress has been made in achieving the target set out for the electricity sector through investment in renewable energy projects, energy efficiency programs and policy reforms. However, international support is necessary to ensuring the low emission pathway chosen by the electricity sub sector is achieved.

The potential for economy-wide emissions reduction is conditional on assistance provided to other sectors such as transport, agriculture, forestry and waste. These sectors have set in place plans and strategies to reduce emissions; however, implementation is a common problem across all sectors due to limited human, financial and technical resources. The transport sector which has the highest sectoral emissions in particular has a regulation in place to restrict emissions from vehicles to a certain level. However enforcement has not been possible due to a lack of technical capacity, technological capacity and financial resources. Enforcement of this regulation will have significant impact on reducing emissions from this sector.

[4] The Samoa National Adaptation Programme of Action, 2005 (NAPA) was developed to identify key sectors with immediate adaption needs.

Solomon Islands Government

INTENDED NATIONALLY DETERMINED CONTRIBUTION

Contents

INTRODUCTION

Solomon Islands comprises a scattered archipelago of 994 islands combining mountainous islands as well as low lying coral atolls within a tuna-rich and potentially mineral-rich maritime Economic Exclusive Zone (EEZ) of 1.34 million square kilometres. The land area of 28,000 square kilometres with 4,023 kilometres of coastline is the second largest in the Pacific after Papua New Guinea. The highest point in the country, Mt Makarakomburu is 2,447m above sea level and is the highest peak in the insular Pacific. There are six main islands, Choiseul, New Georgia, Santa Isabel, Malaita, Guadalcanal and Makira, which are characterized by a rugged and mountainous landscape of volcanic origin. Between and beyond the bigger islands are hundreds of smaller volcanic islands and low lying coral atolls. All of the mountainous islands of volcanic origin are forested with many coastal areas surrounded by fringing reefs and lagoons.

Figure 1: Map of Solomon Islands

The islands are grouped into three different major "geological provinces"; the Pacific Geological Province (including Malaita, Ulawa and North Eastern part of Santa Isabel island); Central Geological Province (Makira, Guadalcanal and the Florida Islands, South-Western part of Isabel and Choiseul) and; the Volcanic Geological Province (New Georgia, Russell Islands, Shortland Islands and North Western tip of Guadalcanal and Savo). Guadalcanal is the largest island and the only one with a significant area of grassland and rich alluvium soils. Most of the islands have highly weathered soils of low fertility with pockets of fertile areas mainly on volcanic islands and river valleys.

The country is situated within the earthquake belt or "Ring of Fire" which makes it extremely vulnerable to the effects and impacts of earthquakes. A major earthquake measuring 8.1 on the Richter scale occurred in the Western Province in 2007 causing a major tsunami that affected the Western and Choiseul provinces and causing 52 deaths and scores missing. About 40,000 people were affected. Many islands have subsided whilst a few have been uplifted a few metres. Extensive damage was experienced throughout the two provinces costing hundreds of millions of dollars. The country and many communities and individuals

are still recovering from this double disaster event.

Climate

Solomon Islands climate is tropical, though temperatures are rarely extreme due to cooling winds blowing off the surrounding seas. Temperature is the least varied of climate parameters with daytime temperatures fluctuating between 25ºC to 32ºC. The rainy season occurs between November to April and the dry season from June to October during the year. Most islands have a mean annual rainfall of 3,000 to 5,500 mm with two-peak rainfalls during the year. The highest rainfall recorded in Solomon Islands is an annual average of 8,304 mm at 430 m above sea level at Koloula on Guadalcanal (Hansell and Wall 1970). Daily rainfall of over 250 mm is normal. High rainfall intensity events occur during tropical storms and often result in flooding of most river systems. The highest recorded rainfall of 281mm over a 12 hour period was recorded in 2009 resulting in destructive flooding and loss of lives. More recently the highest recorded daily rainfall of 318mm was recorded in April 2014 causing widespread flooding and damage to property, infrastructure and loss of 23 lives along the Mataniko River, Central Honiara. Rainfall trends vary across the country and are influenced by geographic differences.

Demographic characteristics

Solomon Islands has 28,400 square kilometers of land, with a population of 598,860 (September 2015 estimate). Solomon Islands has a population density of 21 people per square kilometre. The capital and largest city is Honiara, with a population estimated at 67,000. There are no other cities with a population of more than 10,000 in the country.

Most people in Solomon Islands are ethnically Melanesian (94.5%). Other large ethnic groups include Polynesian (3%) and Micronesian (1.2%), with a few thousand ethnic Chinese in the country. There are 70 living languages in Solomon Islands with Melanesian languages spoken mostly on the main islands. While English is the official language, just 1-2% of the population speaks English.

Ninety two percent of the population is Christian, with major denominations including the Anglican Church of Melanesia (35%), Roman Catholic (19%), South Seas Evangelical Church (17%), United Church in Papua New Guinea and the Solomon Islands (11%), and Seventh-day Adventist (10%). The rest of the population adheres to Islam, Jehovah's Witnesses, the Church of Jesus Christ of Latter-day Saints (Mormons), the Baha'i faith, and “Kastom”.

Around 80% of the national population live on low lying coastal areas. The capital city of Honiara is the only major area of economic activity and attracts increasing numbers of youth and adults per year from other islands seeking employment and income. Urban migration is estimated at 4% and with the current rate of growth the national population is expected to double by 2020.

The Solomon Island’s Human Development Index (HDI) was 0.510 in 2011, and is one of the lowest in the Pacific, and it ranked 142 out of 187 countries (UNDP, 2011). On the achievement of Millennium Development Goals (MDGs) a range of social indicators show that the country is likely to meet Goal 2 (Achieve universal primary education) and Goal 5 (Improve maternal health). Females still have less access than males to secondary and tertiary education while women have poor access to health and family planning services in the rural areas. According to the ADB (2010) much of the improvement in the HDI was the result of significant overseas financial and technical assistance, with aid levels increasing from 22% of GDP in 1990 to 66% of GDP in 2005. An analysis of household income and expenditure data collected in 2005/06 shows that situations of hardship and poverty is rising with 11% of the population experiencing difficulties in acquiring basic needs.

Economy

The bulk of the population depends on agriculture, fishing, and forestry for at least part of its livelihood. Most manufactured goods and petroleum products must be imported. The islands are rich in undeveloped mineral resources such as lead, zinc, nickel, and gold. Prior to the arrival of The Regional Assistance Mission to the Solomon Islands (RAMSI), severe ethnic violence, the closing of key businesses, and an empty government treasury culminated in economic collapse. RAMSI's efforts to restore law and order and economic stability have led to modest growth as the economy rebuilds.

In its 2014 annual report, the Central Bank of Solomon Islands (CBSI) reported that the Solomon Islands economy showed a lot of resilience in 2014 to recover from the negative fallouts from the April 2014 floods and the closure of Gold Ridge mine in the second quarter. Therefore growth for 2014 was revised upward from 0.9% to 2.0% but was down against pre-flood projection of 3.7% as a result of improvements in key non mineral sectors combined with the swift expenditure adjustments both from the national government and its development partners. Favourable external developments in particular rising prices for major export commodities and falling energy prices later in the second half of the year also supported the economic recovery.

Domestic economic activities performed much better than previously anticipated in April 2014. Preliminary estimates from the CBSI pointed to an overall growth of 2.0% for 2014, 1.1 percentage points higher than the 0.9% that CBSI projected in April 2014. All sectors except for mineral, manufacturing and utilities sectors recorded positive growths during the year. Surprisingly, logging activities jumped up significantly to a new unprecedented level during the year. This to a great extent temporarily cushioned the contraction in the mineral sector and boosted overall growth for the year supported by positive developments in agriculture, fisheries, communication, construction, and finance sectors.

Leading indicators in the labour market showed modest growth in employment even though some industries found the year challenging. The mineral sector was the hardest hit with about 720 workers driven out of jobs after the closure of Gold Ridge Mining Limited in the second quarter. Industry consultations the Central Bank conducted earlier this year revealed most companies in the non-mineral sectors either retained their staff or employed a few more people despite the economic shocks in the second quarter. This is consistent with trends in the number of superannuation contributors that rose by 12% over the year to 53,796 people even considering the redundancy exercise in the mineral sector.

Production of key export commodities in the economy weakened further in 2014 owing in large part to the closure of the only gold mine in the country. As measured by the CBSI production index, the commodity sector fell by 4% against the previous year. The overall decline was driven by gold which plunged by 15.3% to outweigh the combined gains in the non-mineral index (see Figure 1b). The fall would have been more drastic if logging activities remained low at the same level as in the first half of 2014. Log production increased dramatically to 2,128,000 cubic meters from 1,897,000 cubic meters in 2013, a jump of 5.3 points over the year to 51.3 in the log index. Re-entry into previously logged areas, clear felling activities, and issuance of additional logging licenses contributed to the sharp escalation in the exported log volumes.

The Government suffered a major setback in 2014 following the devastation caused by the April floods and the closure of the Gold Ridge mine. Fortunately, development partners were quick to respond and the government with available fiscal space have cushioned the revenue shortfall and accommodated high unplanned expenditure pressures. These quickly restored affected infrastructures and minimised economic downtime. The Government

recorded a fiscal surplus of $129 million during the year from revenue collections of $3.1 billion and $3.0 billion in expenditures. The surplus was attributed to unexpected increases in revenue particularly from fishing licenses, increased budget support, and expenditure savings most notably in the capital budget.

Despite the cessation of gold production in the Solomon Islands, total exports rose by 5.3% in the first half of 2015 over the same period in 2014, largely reflecting higher exports of bauxite and agricultural commodities.

After parliamentary elections in November 2014, passage of the 2015 budget was delayed to April to give the new coalition government time to incorporate its spending priorities. The resulting 2015 budget provides for total expenditures that is 11.8% higher than the revised 2014 budget, mostly because of higher expenditure on flood recovery. Total revenues and grants are also projected to rise, but by only 3.3%. Fishing license revenue is seen to increase but not enough to offset revenue declines from suspended operations at the gold mine. The government expects to incur a deficit, equivalent to 4.9% of Gross Domestic Product (GDP), for a second consecutive year and plans to draw down cash reserves to finance the deficit.

Consumer prices have been declining in 2015 following large flood-related price rises last year. Softening international food and fuel prices have contributed. Between January and July 2015, consumer prices were 2.4% lower than in the same period in 2014 driven by reductions in prices for food, drinks and tobacco, and housing and utilities declined. However, core inflation remains positive suggesting that headline inflation will rise in the latter part of the year.

The forecast for 2016 remains unchanged as growth is expected to benefit from planned fiscal expansion.

The domestic economy is expected to be more buoyant in 2015 than the previous year. The interplay between key domestic sectors and global price trends is anticipated to support further recovery. Economic growth is anticipated to increase in 2015 to 3.3% from 2.0% in 2014. In the primary sector, the key drivers are fisheries and agriculture while logging is expected to subside after the significant jump in 2014. The mineral sector, in spite of positive contributions from bauxite exports, would still see a decline in 2015 with the absence of gold. External conditions are expected to improve slightly over the previous year despite expectations that the structural current account imbalance would remain in 2015. Budget support and donor capital inflows are expected to outstrip the current account deficit and boost gross foreign reserves. The export sector however could worsen on the back of anticipated declines from gold and log export receipts while imports are expected to rise modestly. Persistent falling oil prices gives temporary reprieve for the economy in terms of lower fuel import bills at least for 2015.

MITIGATION

INFORMATION ON INTENDED NATIONALLY DETERMINED CONTRIBUTION		
PARTY: Solomon Islands		**DATE: September 2015**
Parameter		**Information**
Period for defining actions		Five year periods. Starting 2020, with reference to 2025 and ending in 2030
Type and level of Commitment		All commitments are premised on: (a) A fair and ambitious agreement being reached, reflecting Common but Differentiated Responsibilities and Respective Capabilities; and (b) Timely access to international climate change financing, capacity building and technology. Solomon Islands is a LDC SIDS, that will nonetheless commit to reduce emissions by: **12% below 2015 level by 2025** and **30% below 2015 level by 2030** compared to a BaU projection. On the understanding that a global agreement addresses international assistance to access financial and technical resources, Solomon Islands can with international assistance, contribute a further: **27%** reduction in GHG emissions by 2025; and **45%** reduction in GHG emissions by 2030, compared to a BaU projection. **With appropriate international assistance, Solomon Islands can reduce its emissions by more than 50% by 2050.**
Reference year or period		2015. The BaU projection is based on an extrapolation of historic data covering the period 1994-2010.
Estimated, quantified emissions impact		In addition to the carbon storage in the forest and ocean ecosystem, Solomon Islands unconditional contribution will reduce 8,300 tCO_2e annually Solomon Islands' conditional contribution (with international assistance) will reduce emissions by 18,800 tCO_2e annually by 2025, and by 31,125 tCO_2e annually by 2030
Coverage	% of National emissions	INDC covers fossil fuels and forest sequestration. Fossil-fuel use covers more than 95% of the reported national inventory
	Sectors	Energy sector: Power (39%) Transport (61%) Renewable and EE Land use, Land Use Change and Forestry
	Gases	Carbon dioxide only (estimated > 95% of inventory)

INFORMATION ON INTENDED NATIONALLY DETERMINED CONTRIBUTION		
PARTY: Solomon Islands		**DATE: September 2015**
Parameter		**Information**
	Geographical boundaries	Whole of country
Further information, relevant to commitment type		Commitments are in the form of Outcomes and Actions. These are referenced as deviation from Business as Usual projections. BaU projections are based on fossil fuel consumption data for the period 1994-2010, with line of best fit extrapolation to 2030. The projection will be revised to include more accurate information with the Third National Communication and Biennial Update Report.
Intention to use market based mechanisms to meet commitments		Solomon Islands will consider other avenues as well as market based mechanisms to support establishment and operation of a National Climate Change Trust Fund
Land sector accounting approach		Appropriate methodologies drawn from international best practice to quantify sequestration from above 400m contour and forest plantations.
Estimated macro-economic impact and marginal cost of abatement		NE
Narrative supporting the fair-share assessment of the contribution		Solomon Islands is a double chain archipelago of small islands with more than 900 volcanic and coral islands and atolls with a 600,000 inhabitants, small land mass, limited technological, technical, financial and human resources and a small economy. Solomon Islands is a LDC SIDS that is in no way responsible for the unfolding climate change catastrophe, yet it is highly vulnerable to adverse impacts of climate change. Current (2015) greenhouse gas emissions from Solomon Islands are approximately 20 $MtCO_2e$/year. This is extremely small: representing approximately just 0.01 % of global emissions. Solomon Islands has very low per capita emissions, at just: 1.2 tCO_2 per person in 2015 based on projected emissions for 2015. This is fourteen times less than the average per capita emissions of Australia (16.5tCO_2/capita), and less than the estimated level required to stay below 1.5 ^oC (as compared to 2^oC) of warming, of around 1.5tCO_2e/capita[1]. Thus, any contribution from Solomon Islands is more than fair, and must be considered ambitious, given Solomon Islands national circumstances. With high vulnerability to climate change impacts Solomon Islands has placed equal importance on mitigation of and adaptation to climate change and recognises the need for developing low carbon economy to achieve its sustainable development objectives.

[1] Using 2011 ddata from World Bank, http://databank.worldbank.org/data/home.aspx.

Mitigation Status and Context

Greenhouse gas emissions are the result of combustion of imported fossil fuels in the energy sector for:

- Electricity generation;
- Sea transport;
- Land transport;

Actions

Solomon Islands has considered mitigation actions that were currently planned and funded (as the Solomon Islands Contribution), and those that have been identified as technically viable with current technology suitable to the Solomon Islands context (as the Contribution conditional on adequate and timely international assistance), are included in the Table below.

Sector	Mitigation option	INDC type	Mitigation in 2025 (tCO_2e)	% of 2025 projected inventory	Mitigation in 2030 (tCO_2e)	% of 2030 projected inventory
Energy	Fiu Hydropower	RE	12,220.2	14.7%	24,440.40	11.52%
	Solar Farm	RE	2,036.7	2.5 %	4,073.40	1.92%
	Tina Hydropower	RE	91,244.2	109.9%	319,354.56	150.48%
	Solar Homes	RE	1697.3	2.0%	3,394.60	1.60%
	Mini Hydropower	RE	1303.5	1.5%	4,562.25	2.15%
	Energy Usage	EE	1629.4	2.0%	3258.8	1.54%

Keys: **RE** - Renewable Energy
EE – Energy Efficiency

The conditional Mitigation Actions will require a timely combination of capacity building, technology transfer, and financial support, primarily in the form of grants. Additional mitigation actions may be identified in the future. Below is a brief summary of the activities proposed for off-grid electricity production, with estimates of financial resources required (in USD).

	Renewable	Capacity	Mitigation potentials in tCO_2e [Annually]	Cost Estimate USD	Status
	Hydropower				
1	Luembalele River	190KW	1,065.22	750,000.00	Feasibility Studies completed
2	Huro River	120KW	672.77	550,000.00	Feasibility Studies completed
3	Mase River	1.750 MW	9,811.20	4,000,000.00	Feasibility Studies completed Needs reviewing
4	Sorave River	200 kW	1,121.28	600,000.00	Prefeasibility Studies completed
5	Rori	300 kW	1,681.92	750,000.00	Feasibility Studies completed
6	Vila River	1.210 MW	6,783.74	4,000.000.00	Prefeasibility Studies needed
	Solar				
7	Taro	100 to 200kW	280.32	300,000.00	diesel/solar pv hybrid system
8	Seghe	100 to 200 kW	280.32	300,000.00	diesel/solar pv hybrid system
9	Afio	100 to 200KW	280.32	300,000.00	diesel/solar pv hybrid system
10	Selwyn College	100KW	140.16	150,000.00	diesel/solar pv hybrid system
11	Kakabona Solar Farm	1 MW	1,401.60	4,000,000.00	solar PV grid-connected plant
12	Solar Farm Honiara	1.5 MW	2,102.40	5,000,000.00	solar PV/grid connected system
13	Savo Geothermal	20 – 40 MW	224,256.00	150,000,000.00	Preliminary assessment done

ADAPTATION

Solomon Islands has been working actively on climate change adaptation for 20 years, and with the development of pioneering tools and methodologies that are regarded as best practices regionally and internationally, has made and continues to make a considerable contribution to the global and regional adaptation planning and management process and pool of knowledge on building climate resilience. This contribution is made in the face of severe constraints and challenges confronted by Solomon Islands as a small island developing States (SIDS) and Least Developed Country (LDC). For Solomon Islands, as with other small islands developing States and Least Developed Countries, where climate change threatens the very existence of the people and the nation, adaptation is not an option – but rather a matter of survival.

Current climate, projected climate change and related assumptions

The interannual climate of Solomon Islands is basically driven by natural drivers such as the Inter-Tropical Convergence Zone (ITCZ), the South Pacific Convergence Zone (SPCZ), the West Monsoon and the El Nino Southern Oscillation (ENSO). The wet season is generally driven by the ITCZ and the West Monsoon resulting in strong north-westerly winds and seas affecting mostly the northern part of the country. Associated heavy and long rainfall periods usually influence agriculture activities in the northern parts of the country during this time. The SPCZ typically drives the weather and the climate of the southern part of Solomon Islands during the dry season where strong southeast trades brings onshore heavy rainfall that disturbs agricultural activities as well.

During an El Nino ocean surface waters over the western Pacific (including Solomon Islands) are usually cooler than normal and warmer than normal from central to eastern of the Pacific. Hence, in most cases, prolonged dry periods could escalate from meteorological drought to agricultural drought in the western Pacific. Solomon Islands experiences drought conditions during El Nino events such as that occurring in 1997 causing water shortages on many islands. The divergence results in nutrient rich waters rising to the ocean surface in the eastern Pacific causing outbreaks in plankton growth which is followed by tuna stocks.

During a La Nina event the opposite seems to happen, where waters over the western Pacific (including Solomon Islands) are warmer than normal hence causing more cloud formation resulting in prolonged and high rainfall periods. Cyclones and high rainfall events are associated with the La Nina periods in the western Pacific. The future of ENSO events is still not clear but it is expected that it will continue to be an important driver of Pacific Islands climate into the future.

Observed temperature data by the Solomon Islands Meteorological Services show that annual surface temperature for the western, central and eastern regions of Solomon Islands have increased during the last 30 to 50 years. The range of increase in mean air temperature for most provinces is between 0.14^{o}C and 0.17^{o}C/decade.

A study carried out by the Pacific Climate Change Scientific Programme (PCCSP, 2011) under Australian Government showed that for three emission scenarios (low, medium and high) using 18 Global Circulation Models the temperature in the Solomon islands will increase by 0.2^{o}C (low) in 2030 to 3.3 ^{o}C (high) in 2090. The sea surface temperature (SST) is projected to increase in the next 30 -70 years in Solomon Islands.

Rainfall data analysed to date show that annual rainfall in the three regions (western, eastern and western Solomon Islands) is mostly varied due to the geography of the different islands, their relative position with each other, the direction and duration of prevailing winds and drivers of climate in the Pacific. However, it can be clearly seen that there were sharp declines around mid-1990s for all the three regions. These declines correlated with the severe El Nino event between 1997 and 1998 that affected most parts of the country. The general trends however show that in the central region there was a decrease in rainfall and a slight increase for the western and eastern regions in the past 30-50 years. The rainfall trends show that:

- In the area around the capital city of Honiara a general decline per decade is occurring while the population is growing at a rate of approximately 6% per annum. To ensure adequate water supply for the growing population of the city a robust and well enforced Integrated Water Resource Management strategy and programme needs to be put in place. Conservation and effective management of the forests surrounding Honiara is essential and increasing numbers of bore holes will need to be established over the coming years to supplement the Kongulae water source in the longer term. The proportion of annual rainfall from extreme rainfall has increased significantly which could result in longer drought periods in the dry season and more severe flooding.
- In Auki town, Malaita Province, a decline in rainfall for both the dry and wet seasons is being experienced.
- In Taro Island, Choiseul Province, a similar trend as Auki is emerging. The plan to relocate the provincial headquarters and town from Taro Island to the mainland area of Choiseul Bay is also a good adaptation strategy that needs to be complemented with an Integrated Water Resource Management strategy and programme.

Tropical cyclones pose a serious threat to the people, economy and environment and result in flooding and wind damage in the Solomon Islands. There have been severe floods on Guadalcanal, Malaita, Makira and Santa Isabel in recent years with a number of lives lost, and severe damage to agriculture and Infrastructure. In 2002 the remote island of Tikopia was hit by a Category 5 cyclone Zoe.

In the Solomon Islands' region, projections tend to show a decrease in the frequency of tropical cyclones by the late 21st century and an increase in the proportion of the more intense storms. As per Pacific Climate Change Science Program (Australian Government), by the end of this century projections suggest decreasing numbers of tropical cyclones but a possible shift towards more intense categories.

Solomon Islands is highly vulnerable to droughts, extreme rainfall, floods, king tides and sea level rise. Droughts are usually associated with the El Nino phenomenon. The 1997/98 El Nino caused severe drought conditions in many parts of the country and one of the major prolonged droughts occurred in the eastern part of the country in the Temotu province in 2004 causing food and water shortages. Another major problem associated with extremely high rainfall or prolonged rainfall is the big decline in the yields of sweet potato, the main staple crop in rural areas, due to increased vegetative growth and decline in the growth of tuber. Flooding can also occur as a result of a combination of factors, including king tides, areas associated with low atmospheric pressure, and rising sea levels. In 2008 king tides struck northern Choiseul, Ontong Java and other parts of the country. These came in the form of high swells never before experienced in the islands. The tides caused more coastal erosion, considerable damage to coral reefs, coastal inundation, pollution of water sources and damage to coastal infrastructures.

Statement of current and near-term adaptation planning and action

The Climate Change Policy (2012-2017) which is linked to National Development Strategy (2011-2020) provides a policy framework for developing and describing ongoing and planned actions (changes in institutions, modified policies and measures, major projects/programs, planning processes, and financial investments) using international and country resources .

Statement of adaptation gaps, barriers and needs

Institutional challenges relating to high staff turnover rates in senior executive positions, limited sector specific training, and a lack of clarity on internal roles and responsibilities in some sectors hampers national efforts on adaptation. Adaptation knowledge sharing, coordination and collaboration among ministries as well as with non-governmental organisations (NGOs), the private sector, faith-based organisations and development partners is less than adequate in the Solomon Islands. There needs to be a focus on development of knowledge, skill levels to address capacity gaps with regards to climate change adaptation and disaster risk reduction throughout Solomon Islands society, particularly in the outer islands and among marginalised populations.

There is need to translate the climate science and predicted impacts into messages that support action by Solomon Islanders. “Kastom” barriers also hamper awareness and action as with very limited capacity at the community level to undertake local level vulnerability mapping, adaptation planning and the implementation of priority adaptation interventions.

Financing needs for priority adaptation interventions

Some adaptation projects have been grouped into thematic areas linked to the priority sectors established in the National Adaptation Programme of Action (NAPA) as well as some recently identified priorities. The total adaptation cost would be US$126,650,000; NAPA would cost US$17,250,000 covering agriculture and food security, water and sanitation, human settlements and human health, education awareness and information; low-lying and artificially built-up islands; waste management; coastal protection; fisheries and marine resources, infrastructure development and tourism. However the total cost of NAPA will have changed considerably upward and therefore will require further evaluation and costing. Other priorities identified through the national communication process would cost additional US$109,400,000. It is expected that a considerable portion of the necessary financing will be provided in the forms of grants from the Green Climate Fund, Global Environment Facility (GEF), Adaptation Fund, and from various bi-lateral climate change programs.

Addressing gaps in national, sector and community-level adaptation and climate resilience programs

It is the intention of the Solomon Islands Government that a community-based vulnerability mapping, adaptation planning and management approach (tied to direct access to financing for community-based resilience-building projects) be employed on a whole of island basis that will build capacity in vulnerable villages for localised adaptation actions which represents a critical contribution to the implementation of adaptation.

The Solomon Islands Government will establish the institutional structures and strengthen capacities at the community level in order to support the country-wide implementation of community-based vulnerability mapping and adaptation planning, and the community-based design and implementation of priority resilience measures through direct access to financing for such measures.

Innovative financing approaches and operations

Based on lessons learned and best practices from Small Island Developing Sates (SIDS), the Government will investigate the viability of, amongst other measures: (i) setting aside the valued added tax charged for fuel; (ii) charging carbon levies; and (iii) charging fees for climate change research undertaken in the country. Such fees and charges will be used to establish and finance a national climate change trust fund for priority climate change measures.

The Solomon Islands Government intends to build national capacity to facilitate direct access to international climate change financing including the Green Climate Fund so as to ensure that financing for climate resilience is country-owned and directed towards priority national needs and community-based adaptation plans and mitigation measures.

Based upon lessons learned from other SIDS, Solomon Islands will seek assistance under the "Readiness" program operated by the Green Climate Fund to establish the necessary legal, institutional and fiduciary management framework and accredit the National Implementing Entity (NIE) needed to facilitate direct access, thereby reducing dependence upon intermediary agencies for the design and implementation of priority adaptation and mitigation interventions.

The Solomon Islands Government will strengthen measures to improve donor collaboration on climate change adaptation and mitigation programming, and will establish the mechanisms for improved coordination amongst government agencies in the design and implementation of priority adaptation and mitigation programs and projects as defined under NAPA and the national communications.

The Ministry of Environment, Climate Change, Disaster Management and Meteorology (MECDM), as the coordinator and entry point, for climate change programming engagement with all development partners, will ensure that all projects funded by external sources support the implementation of NAPA, community adaptation programmes and mitigation measures. In the exercise of this function and responsibility, MECDM shall ensure that international climate change programming supports the implementation of NAPA and community-based adaptation programmes and mitigation measures.

MEANS OF IMPLEMENTATION

The effective implementation of the adaptation and mitigation measures in Solomon Islands' INDC is conditional upon and will depend on the accessibility, availability and timely provision of financial resources, technology and capacity building support.

EQUITY

The Solomon Islands is a small contributor to the greenhouse gas emissions by any measurable indicator and yet it is at the frontline of the wrath of climate change and sea level rise. Solomon Islands has a right to develop its economy and improve the well-being of its population. Thus Solomon Islands contribution towards limiting the global temperature to below 1.5^0C relative to pre-industrial levels provides a moral imperative as a global citizen. The government has embarked on a number of actions which will result in increasing the use of renewable energy technologies, improving energy security and reduction of GHG emissions. However, the main focus for long term sustainable development still remains the issue of addressing the adverse impacts of climate change and its consequent sea-level rise.

KINGDOM OF TONGA

INTENDED NATIONALLY DETERMINED CONTRIBUTIONS

Towards achieving the objective of the United Nations Framework Convention on Climate Change.

4 December 2015

Contents

Key Messages

Climate Change continues to pose irreversible threat to the people of Tonga, its society, livelihoods, and its national environment. The interference to the climate system from human-caused climate change is already affecting Tonga's development, livelihood of its people and future. The World Risk Report has ranked Tonga as one of the world most at-risk country for natural hazards, and sea level rising.

Tonga makes a negligible contribution to global greenhouse gas emissions, with low per capita emissions of 2.95 tCO_2e whilst notably; the increasing frequency of strong destructive tropical cyclones has affected Tonga's development with damages on average costing 20 percent of GDP. Extensive coastal erosions across the Kingdom has prompted Government to direct over 30 percent of mobilized development assistance to address it during the last six years, and lack of climate proofing investments further risks Government's poverty alleviation commitments and national development.

Irreversible loss and damage from extreme weather events and coastal erosions are critical areas whereby national response are limited influencing the designed national contributions through reducing emission and also on creative smart resilience investments.

Taking into account its negligible emission and limited capability, Tonga's intended contributions are designed to be quantified at the national level cascaded to the sector level as follows:

- 50% of electricity generation from renewable sources by 2020. In 2015 renewable energy accounts for approximately 9% of total electricity generation, with confirmed and funded investments taking this to 13% in 2016.
- 70% of electricity generation from renewable sources by 2030
- Improve Energy efficiency through reduction of electricity line losses to 9 percent by 2020 (from a baseline of 18 percent in 2010)
- To double the 2015 number of Marine Protected Areas by 2030
- Sector Emission Reduction Targets: Transport, Agriculture, Environment Friendly Waste Management and Reforestation
- Other Sectors Climate Resilience: Public Infrastructures, foreshore protection, buildings and houses.

INDC is designed for both reduced emission and increased investing in climate resilience, Tonga makes an explicit call for a more cost-effective national response and avoids the much bigger costs caused by climate inaction. To facilitate this high level commitment, Government has raised climate change to Ministerial level, establishment of the Legislative Assembly Standing Committee for Climate Change, developing of National Climate Change Policy, revision of the Joint National Action Plan to Integrate Climate Change and Disaster Risk Reduction, and development of the third Climate Change National Communication.

Tonga's INDC will also require basic information and data so that they can be understood clearly by key stakeholders to achieve consensus in setting realistic emission reduction targets and smart resilience investments. The intended contribution also include adaptation, mitigation and means of implementation: TSDF national planning framework with its national goal to achieve a more inclusive, sustainable and effective land administration, environment management, and resilience to climate and risk, finance initiatives and capacity building.

Overall, Tonga's INDCs should raise the Kingdom ambition to contribute towards a robust and ambitious legally binding COP21 climate change agreement.

Section 1: Introduction

This island Kingdom of Tonga is located in the Central South Pacific. It lies between 15° and 23° 30' South and 173° and 177° West. Tonga consists of four clusters of islands extended over a north-south axis: Tongatapu (260sqkm) and 'Eua (87sqkm) in the south, Ha'apai (109sqkm) in the middle, Vava'u (121sqkm) in the north and Niuafo'ou and Niuatoputapu (72sqkm) in the far north. Nuku'alofa, the capital is situated in Tongatapu, the largest island.

Tonga's archipelago is situated within 200km of the subduction zone of the Indian- Australian and the Pacific tectonic plates which is part of the Pacific Ring of Fire where intense seismic activities occur and a potential source of tsunami. Most of its atoll islands including the main island are very flat with an average altitude of 2–5 meters and hence Tonga is highly vulnerable to sea level rise, storm surges and tsunami inundation.

In June 2012, the population of Tonga was estimated at 103,219 which is five times higher than 1901, with most of this growth existed between the 1930s and 1970s. Tongatapu is the most populous island and has the highest population density. Increased population, along with urbanisation and development has resulted in substantial pressure on, and degradation of, land and marine resources. This in turn has reduced the resilience of Tonga's environment and its people to climate change impacts and disaster risks.

Since June 2013, Tonga moved from a lower middle to upper middle-income bracket, with a nominal GDP per capita for 2013/14 of about $7,636 or about US$3,800. Because of Tonga's large receipts of remittances, running at over 20% of GDP, Gross National Income (GNI) per capita (about US$4,500 in 2013) is a better measure of the actual income going to Tongans. Since 2005 Tonga's GNI per capita has grown considerably faster than the average for the region, increasing from about the same as the regional average to 35 percent greater. However, these figures are average figures for Tonga and do not give a clear indication of distribution or inequality. The latest Household Income Expenditure Survey (HIES) of 2009 indicates an increase in the percentage of the population living below the poverty line increasing to 22.5 percent compared to 16.2 percent in the 2001 HIES. The increase was greatest on the outer islands increasing from 11.8 to 22.9 percent.

The current anthropogenic greenhouse gases and warming of the atmosphere have negatively impacted Tonga's environment, its people and their livelihoods. The most recent report from the Pacific-Australia Climate Change Science and Adaptation Planning Program (PACCSAP) provided the following future projections to 2100 for Tonga:

1. El Niño and La Niña events will continue to occur in the future (*very high confidence*), but there is little consensus on whether these events will change in intensity or frequency;
2. It is not clear whether mean annual rainfall will increase or decrease and the model average indicates little change (*low confidence in this model average*), with more extreme rain events *(high confidence*);
3. Drought frequency is projected to decrease slightly (*low confidence*);
4. Ocean acidification is expected to continue *(very high confidence);*
5. The risk of coral bleaching will increase in the future (*very high confidence);*
6. Sea level will continue to rise *(very high confidence).*

Recent climate and weather events in Tonga, particularly in Ha'apai (a sequence of drought, Cyclone Ian, and further drought), are a window to a future that will increasingly involve multiple stresses from the above (1-6) along with the pre-existing environmental, social, and economic stresses. Building greater resilience to existing extreme natural events and the threat of climate change is essential to ensure the sustainable progress that is desired. These and other potential threats require Tonga to become better equipped to plan and respond o the unexpected. This requires considerable foresight in planning and improved monitoring and evaluation of progress.

Section 2: National Response

The INDC recognises that Climate Change is the single biggest issue that will determine the future of Tonga over the coming decades and will require a 'whole of Tonga' level of cooperation and coordination.

The Tongan Strategic Development Framework 2015-2025: A more progressive Tonga: Enhancing Our Inheritance (TSDF 2015-2025), presents the country's new development framework. TSDF sets one of its seven Goal to commit the Kingdom to 'a more inclusive, sustainable and effective land administration, environment management, and resilience to climate and risk' and identifies the high level societal results required to improve the quality of life of Tongan citizens which include *inter alia*:

1. Informing all national stakeholders and development partners of the broad Organisational Outcomes that are needed to support the country's National Outcomes and Impact;
2. Guides the formulation of sector plans, MDA corporate plans and the medium term budgetary framework (MTBF) through which resources are allocated;
3. Guides the development of Government external economic relations and the country strategies and assistance programs of development partners;
4. Provides indicators, with targets, to facilitate monitoring and measurement our high level progress.

The TSDF 2015-2025 is designed to achieve the desired national impact of a ***"A more progressive Tonga supporting a higher quality of life for all."*** The achievement of this is supported by seven National Outcomes:

A. a more inclusive, sustainable and dynamic knowledge-based economy

B. a more inclusive, sustainable and balanced urban and rural development across island groups

C. a more inclusive, sustainable and empowering human development with gender equality

D. a more inclusive, sustainable and responsive good-governance with law and order

E. a more inclusive, sustainable and successful provision and maintenance of infrastructure and technology

F. a more inclusive, sustainable and effective land administration, environment management, and resilience to climate and risk

G. a more inclusive, sustainable and consistent advancement of our external interests, security and sovereignty

While resilience to climate and risk is an explicit component of Outcome F it is essentially a cross-cutting issue that is of relevance to all seven National Outcomes. In support of the TSDF the INDC response to support Tonga's nationally determined contributions are approached in two national process and two contributing clusters:

1. National Process;
   a. Political and national drivers: strong national political leadership led by Government with cascaded governance reporting to Cabinet and to a Parliament Standing Committee required and supported by strong governance and national implementation
   b. Sectoral and technical drivers: provide the national process to facilitate bottom-up engagement of sectors, private sector and economy wide process to identify and analyse options required for reduced emission. It is important for this driver to ensure sufficient time is needed for establishing emissions pathways by sectors.
2. Contributing Clusters to build a Resilience Tonga;
   a. Reduce emissions
   b. Investment in resilience

Section 3: Approach to Building Resilience to Climate Change

Within the national response context adopting the TSDF 2015-2025 the framework for building resilience to climate change in Tonga will use the new Climate Change Policy (2015-2020).

The purpose of the new Tonga Climate Change Policy is to provide a clear vision, goal, and objectives to direct responses to climate change and disaster risk reduction over the next five years. The policy, and the associated, soon to be revised, Joint National Action Plan for Climate Change Adaptation and Disaster Risk Management (JNAP). The Climate Change Policy is not intended to replace or duplicate sector specific policies and plans. Rather, it is intended to provide an overarching context and guiding framework with policy objectives that for the most part will require multi-sectoral coordination.

The overall focus is towards the goal of **'A Resilient Tonga'**, aimed at achieving outcomes that are realised more widely than can be achieved through a more conventional, compartmentalised approach. Rather than address climate change adaptation, mitigation and disaster risk reduction in a fragmented manner, a holistic approach is taken to build resilience. There are five action areas:

1. Mainstreaming for a Resilient Tonga – To fully mainstream the goal of a Resilient Tonga into government legislation, policies, and planning at all levels;
2. Research, Monitoring, Management of Data, and Information – To implement a coordinated approach to the collection, monitoring, management and use of all relevant data and information; and to develop a coordinated, multi-sectoral approach to research for building a Resilient Tonga;
3. Resilience Building Response Capability – To develop the capability for resilience building responses throughout government, the private sector, and civil society;
4. Resilience Building Actions – To implement actions that are designed towards the building of a Resilient Tonga by 2035 at national, island, and community level;
5. Finance – To implement actions that are designed towards the building of a Resilient Tonga by 2035 at national, island, and community level.

Table 1. Approach to Building Tonga's Resilience.

INDC Action Areas	**National Process**		**Contributing Clusters**	
	National	**Sectoral**	**Emissions Reduction**	**Investing in Resilience**
1. Mainstreaming for a Resilient Tonga	TSDF, Cabinet, LA Standing Committee	Legislations, regulations, NIPS, MEIDECC, JNAP,	Mitigation, adaptation, RE 50 Percent Target, Forestry Targets,	Technology transfer, capacity building
2. Research, Monitoring, Management of Data, and Information	Census, Sectoral Assessments, Scientific Assessments	Energy, Transport, Building Infrastructures, Agriculture, Forestry, Water, Waste, Environment	Determine scientific targets for the Sectors	New innovation, high technology, energy efficient appliances and disincentive for inefficient appliance
3. Resilience Building Response Capability	Mainstream TSDF M&E, Climate Change Policy	Finalize Sector Pathways	Revised JNAP Climate Change Policy Actions Recommended options	New initiatives to invest resilience economy wide infrastructure, buildings, sea wall and foreshore protection, Incentives to invest resilience energy efficient appliances
4. Resilience Building Actions	Annex 1	Sectoral targets	Reduced Emission Pathways	Smart Investments,

				climate proofing public infrastructure, housing, communities, region and islands
5. Resourcing and finance: To implement designed actions towards the building of a Resilient Tonga by 2035	Costed options targeting to mobilize finance sourced from recurrent (local), national (economy wide) and international and global facilities	Costed Policy options	Costed Pathways and Implementation Plans	Costed Options and Implementation Plans

Integral to the policy is the planning process which links national, island, and community planning (under Objective 1: Mainstreaming) with action (under Objective 4: Resilience Building Actions).

The mechanism for implementation will be through a new Joint National Action Plan for Climate Change Adaptation and Disaster Risk Reduction (JNAP), along with all other plans (at sector, island, and community level) that are fully aligned with the goal and targets of the policy. The new JNAP, to be finalised by mid-2016 at the latest, will be fully aligned with the climate change policy objectives. Specific activities will be identified, with measureable indicators to align with the TSDF 2015-2025, and also be fully costed. This will be indeed crucial for negotiating and securing of funding from donors for implementation of this plan.

The achievement of the climate change policy objectives will be heavily reliant on donor support to develop or revise policies for all relevant sectors to ensure full alignment with the goal of a Resilient Tonga.

A new climate change policy and JNAP with further identified costed activities will be prepared by 2020. Funding to implement this policy and plan will be strongly dependent on donors support.

Section 4: Sector Policies and Plans

Annex 1 provides an outline of the sector legislation, policies, and plans aligned with the goal of a Resilient Tonga. Focusing on sector policies and plans in particular it is clear that there are significant gaps that need to be addressed. Climate resilience is addressed as a cross-cutting issue with both adaptation and mitigation benefits whereby key resilience building statements cover:

1. Halting deforestation and degradation of indigenous forests;
2. Maintaining national parks, reserves and protected areas;
3. Establishing and managing forest reserves;
4. Promoting reforestation and rehabilitation of cleared and degraded forests with climate change resilient, and ecologically and socially appropriate tree species;
5. Promoting integrated agroforestry in areas earmarked for agriculture;
6. Discouraging tree removal on tax allotments;
7. Encouraging tax allotment holders to plant and manage trees on their properties.

In addition the importance of trees for protection of coastal areas is identified. All of the above are important adaptation measures which will provide significant mitigation co-benefits. The latter are discussed more fully in the mitigation section.

There are also significant gaps with sector plans. Aside from the current, and soon to be revised, JNAP the most important recent plan is the Tonga Agriculture Sector Plan (TASP). The goal of the TASP is to "increase and sustain resilient agriculture livelihoods". There are four strategic objectives aimed at meeting this goal:

1. To develop a climate resilient environment;
2. To improve the enabling environment;
3. To develop diverse, resilient farming systems for the Kingdom's islands;
4. To increase and sustain rural incomes across the Kingdom.

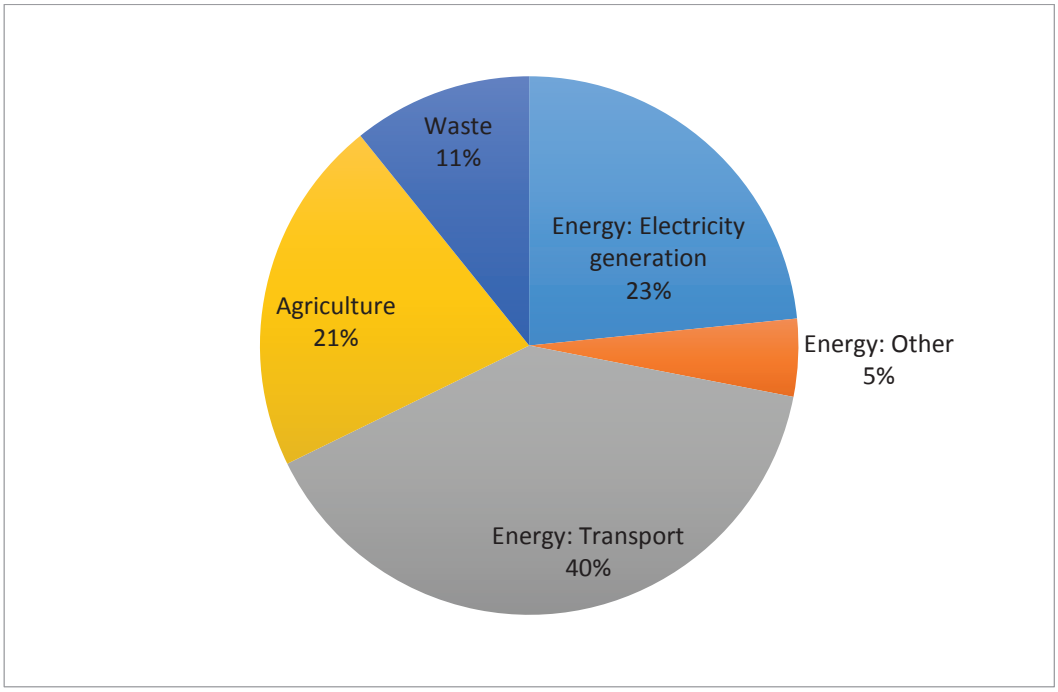
The TASP recognises the importance of, and includes strategies to support, climate-resilient agricultural production systems which are driven by healthy soils, secure and sustainable water supplies, diverse farming systems, and adaptive rural communities. The TASP contains fully costed programmes and activities covering a five year timeframe, and includes a results framework which includes specific indicators and targets.

Section 5: Mitigation context

Tonga, like other SIDS, makes a negligible contribution to global greenhouse gas emissions, with low per capita emissions of 2.95 tCO_2e, and total emissions of 300.54Gg CO_2e (2006 data). When land use and forestry is taken into account, Tonga is a net carbon sink, with its forests absorbing substantially more greenhouse gas emissions than is emitted through all other sources. Nonetheless, as a country with much at stake in regard to climate change and variability and natural hazards, Tonga is strongly committed to climate change mitigation. Its primary focus on poverty alleviation and climate resilient development has many co-benefits in the area of mitigation.

The sectoral breakdown in Figure 1 shows the energy sector, with transport (primarily land based transport) then electricity generation as the highest sources of emissions, followed by the agriculture and waste sectors.

Figure 1: Breakdown of Tonga's GHG emissions, excluding land use change and forestry (LUCF) (2006 GHG Inventory)



Within land use change and forestry, forest and grassland conversion of biomass represents a source of slightly larger magnitude than energy industries and transport combined. However this is offset by removals from forests, making Tonga a net carbon sink overall, in the order of 1691.97 Gg CO_2e.

Thus the reduction of emissions from the energy sector, and the maintenance of Tonga's forest resources and preservation of forest ecosystem services for a climate resilient future should be the primary focus of mitigation actions into the future.

Energy: Electricity Generation

The dominance of energy as a GHG emitting sector underscores Tonga's current reliance on imported oil for its development needs, which supplies all transport fuel, much of the energy for water pumping, and over 90% of grid-supplied electricity. As a consequence, the Tongan economy and electricity consumers in particular have been exposed to high and volatile electricity prices linked to oil prices over the last fifteen years. This is more acute than some other larger Pacific Island countries, as Tonga does not have hydropower potential.

Energy is a fundamental building block for the Kingdom in its social and economic development and in enhancing the livelihood and wellbeing of all Tongans. Accessible and affordable electricity that is environmentally responsible and commercially viable is considered a key catalyst for sustainable economic growth. Further, accessible, affordable and sustainable electricity is crucial to achieve the Government's primary target of 'poverty alleviation' including increasing access to electricity from 89 to 100%. Increased access to electricity, along with additional growth in commercial and residential demand was forecast in 2010 to lead to a 50% increase in electricity consumption by 2020 in the absence of action on renewable energy and energy efficiency.

This reliance on oil imports is incompatible with the aspirational goal of the Tonga Climate Change Policy, to achieve a resilient Tonga by 2035. Recognising the issue as a matter of national significance, in 2010 the Tongan Government released the *Tonga Energy Road Map (TERM) 2010-2020* a "ten year road map to reduce Tonga's vulnerability to oil price shocks and to achieve an increase in quality access to modern energy services in an environmentally sustainable manner".

Under the Roadmap, Tonga's initial target was to supply 50% of electricity generation through renewable resources by 2020. Furthermore, reducing the level of electricity network losses to reach at most 10% of total electricity generation in the country. While the targets was ambitious, it represented a clear direction and indication from the Government that reducing the vulnerability of the country to future oil price shocks is a key objective, and that renewable energy is expected to be a major element of a strategy to enhance energy security and reduce climate change for the Kingdom. There is already a plan to increase from 50% to 100% of RE in total electricity production by 2030. The Government has been proactively working towards the RE target, with over a million litres of diesel fuel oil projected to be saved per annum from March 2015. The Government also aims to replace all diesel-based water pumping engines by 2017 using solar power.

Implementation of the Tonga Energy Road Map will help Tonga to achieve its energy strategic objectives of accessible to affordable energy prices, improve accessible to clean energy and reliable power supply. That will lead to increased economic growth, which improve quality of life for all Tongans.

Energy: Transport

While transport fuel (primarily for land transport) is the largest component of energy sector emissions and the biggest driver of oil imports, it is not currently covered by the Roadmap. Due to the lack of available technological solutions for the transport sector and limited national focus on this area to date, the ability to quantify the mitigation potential or cost associated with the transport sector opportunities is limited. However, the Government of Tonga is in the process of developing transport sector measures to include in the TERM strategies, and has undertaken training and public awareness actions on vehicle maintenance, public transport and bicycle usage. The Kingdom is particularly interested in biofuels for both transport and electricity generation, developed in alignment with Tonga's resilience focus, ensuring sustainable production and replanting. Tonga is participating in regional transport sector mitigation

efforts being developed by the Secretariat of the Pacific Community, and welcomes international assistance in the development of meaningful and wide ranging mitigation opportunities to reduce Tonga's oil dependence and GHG emissions in this sector. This is crucial for a resilient Tonga, especially the plan to include diesel engines efficiency services training to help reduce fossil fuel consumption in the country. Furthermore, the identified private sector interest on solar car public transport campaign for tourists would help add values to reducing petroleum consumption in the sector. Refer to transport actions included in Annex 2.

Land Use Change and Forestry

As identified in Section 4, the National Forest Policy (2010) is of particular importance in terms of adaptation and mitigation co-benefits. A suite of activities regarding forest preservation, forest management and regulation are planned, in alignment with Tonga's resilient development strategy. These will form part of an unquantified mitigation contribution, as mentioned in Section 6.

Agriculture

Emissions in the agriculture sector are principally a function of livestock numbers. Some mitigation co-benefits may result from plans to enhance the climate resilience of the agriculture sector (e.g. through improved soil management practices, development of agro-forestry systems, and increased use of biogas systems that also provide organic fertilizers). Additionally, improvements in animal welfare through greater water availability to stock and improvements in feed quality could likely lead to reduced methane emissions.

Section 6: Mitigation contribution

Information on Tonga's mitigation contribution is provided in the following tableaux form.

COUNTRY: Tonga	**DATE: October 2015**
Parameter	**Information**
Period for defining contribution (outcomes)	Contribution year/s: 2020, 2030 Implementation period: 2015 – 2030.
Type and level of contribution	Tonga's contribution is **50% of electricity generation from renewable sources by 2020**. In 2015 renewable energy accounts for approximately 9% of total electricity generation, with confirmed and funded investments taking this to 13% in 2016. Tonga's contributions will also include the following:. · **70% of electricity generation from renewable sources by 2030** · **Improve Energy efficiency through reduction of electricity Line losses to 9 percent by 2020 (from a baseline of 18 percent in 2010)** · **To double the 2015 number of Marine Protected Areas by 2030** · **Sector Emission Reduction Targets: Transport, Agriculture, Environment Friendly Waste Management and Reforestation** · **Other Sectors Climate Resilience: Public Infrastructures,**

COUNTRY: Tonga		DATE: October 2015
Parameter		**Information**
		foreshore protection, buildings and houses. Emissions reduction benefits of these activities have not yet been estimated; however additional emissions reductions delivered through these activities may be substituted for electricity sector contributions.
Data sources and methods		Estimates of GHG emissions are based on methodologies used in 3rd GHG Inventory, and Draft Third National Communication (both in development, using 2006 data) and IPCC 2006 Guidelines.
Estimated quantified emissions impact		In 2006 electricity generation contributed 40 Gg CO_2e as an emissions source. The Tonga Energy Roadmap Business as Usual forecast predicts a 35% increase in diesel consumption for electricity generation from 2006-2020, assuming continued economic and population growth, increasing electricity access to 100%, and no GHG abatement measures. A 50% renewable energy contribution in 2020 would equate to a reduction of 9.4 million litres of diesel per annum, or approximately 27 Gg CO_2e.
Coverage	Sectors	Energy - Electricity (23% of 2006 emissions) Transport Agriculture Waste
	Gases	Carbon dioxide (CO_2); Methane (CH_4); Nitrous oxide (N_2O)
	Geography	Whole country
Planning Processes		This INDC was prepared primarily using pre-existing national policy documents, and sector policies and plans to ensure accurate reflection of national development priorities, with pre-existing stakeholder support. The INDC was reviewed by Tonga's Climate Change Technical Group, including representation of all key relevant agencies/Government Ministries, before formal Cabinet endorsement.

Section 7: Climate Financing and Resourcing the INDC

Prior to COP21, Tonga's commitment over the past six years recorded over 30 percent of development assistance supported Tonga's climate change. In addition to Government's ex-ante funding, Tonga does not have any dominant funding source for climate change but instead rely on the range of international and bilateral sources.

Government has consolidated MEIDECC as the vehicle to step up its ambition and mobilizing climate financing and resourcing including recurrent (local), national (economy wide) or transnational financing The INDC framework provides the strategy towards low emission and scaled up investment in climate resilient development of Tonga. The INDC can serve as a key component Tonga's climate action plans, financing and resource mobilization by adopting the following short to medium initiatives recommended by the 2015 Climate Financing and Risk Governance Assessment;

1. Open to access climate financing through multiple channels;

2. Explore multi-pronged approach to accessing climate funds but not limited to the Green Climate Fund, Adaptation Fund, Climate Technology Centre and Network Global Environment Facility;
3. Open Processes for Climate Financing Options
4. Commit appropriate recurrent budget to maintain stable, permanent, well trained cadre of climate financing staff to monitor and evaluate climate financing opportunities;

Section 8: Stakeholder Engagement

In preparation for COP21, Tonga has agreed to table its INDC under the TSDF framework where key stakeholder engagements at local, regional and national level, to the climate change are facilitated by the TSDF institutional arrangements for monitoring and evaluation on an annual basis.

In light of this IDNC, in partnership with economy wide counterparts, MEIDECC will host a broader set of stakeholder consultations post COP 21 after December 2015. The consultations will provide an opportunity to discuss Tonga's position, fill gaps and build a common understanding and approach towards the agreed Paris COP21 and Tonga's INDC. These stakeholder engagements will provide an opportunity to raise awareness, mobilize, inform and engage with key stakeholder groups and the general public around climate change issues, and climate change approach and response efforts at all levels.

Section 9: Statement on "Fair and Ambitious"

As noted, Tonga is classified as one of the most at-risk countries in the world in terms of its exposure to the unfolding effects of climate change. The current need for Tonga to invest large portions of its public service capacity in the ambitious quest to achieve our climate resilience objectives is a consequence of the emissions of other large countries over many generations as they developed and became wealthy.

Achieving the contributions set out in Tonga's INDC will require considerable support for capacity and technology investment.

Section 10: General caveats statement

The preparation of this INDC came at a time when Tonga is finalising its Third National Greenhouse Gas Inventory Report, a major component of its Third National Communication on Climate Change Project. This has meant that data on GHG emissions and emission projections are still provisional. Data provided in this INDC is therefore subject to revision. The Third National Greenhouse Gas Inventory Report, once completed, will provide a more comprehensive presentation of Tonga's circumstance, plans and needs.

Annex 1

Table 2: Extent to which current Legislation, Policies and Plans are aligned with a Resilient Tonga

	Legislation	Policy	Plan
Sector/focal area	Fully aligned with a Resilient Tonga		
	Partially aligned with a Resilient Tonga		
	Not aligned with a Resilient Tonga		
	A priority for completion/development; and to be fully aligned with A Resilient Tonga		
	Needs to be reviewed		
Finance and Planning	TSDF		
	Public Financial Management Act		National Infrastructure and Investment Plan
			CFRGA
Climate Change	Climate Change Fund Bill Ozone Layer Protection Act	Climate Change Policy	Revised JNAP
Environment	Environment Management Act and EIA Act		Revised National Biodiversity Strategy and Action Plan
Energy	Renewable Energy Act	Renewable Energy Policy	Tonga Energy Roadmap
	Energy Bill		
Meteorology	National Emergency Management Act		
DRM	National Emergency Management Act		JNAP, National Emergency Management Plan
Internal Affairs	District & Town Officers Act Fono's Act		Community Development Plans and Island Strategic Development Plans
Infrastructure	National Spatial Management Act Building Control and Standards Act		Building Code Urban Infrastructure Development Plan
Lands & Natural Resources	Land Act	Land Use Policy	Land Use Plan
Women	Family Protection Act	National Policy on Gender and Development	Strategic Plan
Culture and Youth	Parks and Reserves Act Polynesian Heritage Trust Act Preservation of Objects of Archealogical Interests Act	National Youth Policy	Tonga National Youth Strategy and Action Plan
		National Cultural Policy	National Cultural Plan
Health	Public Health Act 2008 Health Services Act 1991 Health Promotion Act 2007		Tonga National Strategy to Prevent and Control Non Communicable Diseases
Agriculture		Agriculture Policy	Agriculture Sector Plan
Fisheries	Fisheries Management Act SMA Act		Fisheries Sector Plan
Forestry	Forests Bill 2015	Forestry Policy	Forestry Plan
Tourism	Tourism Act 2012		Tonga Tourism Roadmap 2013-17
Water	Water Resources Bill	National Water Policy	Water Plan
Education	Education Act 2014	Education Policies	

Annex 2

Specific strategies, policies, plans and actions, including timing and support needs

The table below provides a summary of current priority items that Tonga wishes to highlight as needing support or that are significant initiatives that the government will take from their own budget resources.

These relate principally to mitigation actions, due to the current availability of information. This table does not provide details on general resilience building and adaptation. For this to be properly done would require a detailed facilitated process. This has not been possible to do given time and budget constraints. As an important general point, the investments required to deliver a resilient future for Tonga in the face of climate change will be very significantly larger than just those addressing investments in the energy sector.

Item	Planned period of implementation	Conditional on additional support? Y	N	Support partner(s) identified? Y	N	Notes
Priority enabling activities:						
Smart Grid (SCADA Upgrade | Central Control | GIS Enhancement)	2016-2017		√	√		Smart Prepay Metering already funded to $4.2m TOP
Ring Distribution Network Topology	2016-2017		√	√		World Bank have seed funds to start transformation.
Fourth feeder	2016-2017		√	√		
Energy Policy and development of Energy Bill						
Other Energy Sector Reforms/Regulatory Development (Electricity Tariff Review, Petroleum Supply Assessment, Data Repository Updating and Networking, Capacity Development)	2015-2020				√	SPC and UNEP
Priority near-term investments:						
Solar Data Collection	2016-2018	√			√	OIREP. Current funding $6m TOP.
Large 3rd Party Solar Generation | Medium 3rd Party Solar Generation | Small 3rd Party Solar Generation	2016-2020	√			√	US$ 30m in investment required to contribute to 50% RE goal.
Wind Farm |Ha'apai Micro Wind | Outer Island Wind Data Collection	2016-2018	√			√	MFAT/JICA. Current funding $40m TOP.
3rd Party Wind Generation	2017-2019	√			√	
'Eua Biomass | Tongatapu Biomass	ASAP	√			√	Current funding $4.6m TOP.
Vava'u Biomass	2020-2022	√			√	
Development of new RE sources: Coconut Oil |	2020 – 2025	√			√	

Heat Recovery | Bio-gas | Tidal						
Solar water pumping (Phase I, II and IIIa)	2014-2015		√	√		Current funding $2.85m TOP.
Solar water pumping (Phase IIIb, Tourism and Agricultural Sectors)	2016-2025	√			√	
Solar Freezer System (Phase I Vava'u and Ha'apai Outer Islands)	2016		√	√		Current funding $2m TOP.
Solar Freezer System (Phase II Tongatapu and Niuas)	2017-2020	√			√	
Solar Home System Phase 1 [Off Grid]	2016		√	√		Current funding $0.6m TOP.
Solar Home System Phase 2 [Off Grid, main islands]	2019-2020	√			√	
PV Mini-Grid System (Phase 1) for Ha'ano, 'Uiha, Ha'afeva, Nomuka, Niuatoputapu islands	2016		√	√		Current funding $2.4m TOP.
PV Mini-Grid System (Phase 2) for Hunga, Falevai, Niuafo'ou islands	2018-2025	√			√	
Development of energy storage strategy	2016 – 2017	√			√	OIREP Ha'apai will be a lighthouse project.
Energy Efficiency strategy	2016-2017				√	Building on PEEP and PEEP2
Enforcement of Minimum Energy Performance Standards Regulation [Cooling Equipment]	2013-2017				√	SPC AusAid. (AUD 2.7m)
Additional activities to achieve 50% renewable electricity generation by 2020:						
Network Efficiency: & Power System Monitoring: Village Electricity Network Upgrade	2014-2016		□	□		Funded by NZ (40m NZD)
Diesel Engines Fuel Efficiency Services Training	2016-2020	□			□	
Solar Vehicle Public awareness Tour Project	2015-2020	□			□	Identified Private Sector Investment Interest
Additional activities to achieve 100% renewable electricity generation by 2030:						
Geothermal Power Generation	2020-2030	□			□	JICA interest
Biomass and Waste Power Generation	2020-2030	□			□	China interest
Investment in Resilience:						
Scientific and technology transfer	2015-2030	□			□	JICA interest
Disaster Resilience	2015-2030	□			□	World Bank
Sea Wall and Foreshore Protection	2015-2030					ADB and EU
Climate Proofing						
Public Infrastructure	2015-2030					World Bank
Housing	2015-2030					TBC

Government of Tuvalu

Intended Nationally Determined Contributions

Communicated to the UNFCCC on 27 November 2015

Introduction

In accordance with the relevant paragraphs of Decisions 1/CP.19 and 1/CP.20, Tuvalu hereby communicates its Intended Nationally Determined Contributions (INDC) towards meeting the ultimate goal of the UNFCCC, and provides up-front information in tabular format to facilitate the clarity, transparency and understanding of the INDC. Additional accompanying information, relating to mitigation actions and support for implementation, is provided.

Intended Nationally Determined Contributions (INDC)

Tuvalu commits to reduction of emissions of green-house gases from the **electricity generation** (power) sector, **by 100%, ie almost zero emissions by 2025**.

Tuvalu's indicative quantified economy-wide target for a reduction in total emissions of GHGs from the entire **energy sector** to **60% below 2010 levels by 2025**.

These emissions will be further reduced from the other key sectors, agriculture and waste, conditional upon the necessary technology and finance.

These targets go beyond the targets enunciated in Tuvalu's National Energy Policy (NEP) and the Majuro Declaration on Climate Leadership (2013). Currently, 50% of electricity is derived from renewables, mainly solar, and this figure will rise to 75% by 2020 and 100% by 2025. This would mean almost zero use of fossil fuel for power generation. This is also in line with our ambition to keep the warming to less than 1.5^0C, if there is a chance to save atoll nations like Tuvalu.

Tuvalu considers that the focus of INDCs should primarily be mitigation. Notwithstanding the invitation to Parties in Decisions 1/CP.20, par. 12 to "consider communicating their undertakings in adaptation planning or consider including an adaptation component in their INDCs", Tuvalu's vulnerability and the adaptation actions continue to be comprehensively articulated in other national documents such as NAPA, National Communications, National Strategic Action Plan for Climate Change and Disaster Risk Management, National Climate Change Policy. The government plans to develop its National Action Plan in 2016.

Information to Facilitate Clarity, Transparency and Understanding

Tuvalu		**27 November 2015**	
Parameter		**Information**	
Period for defining actions		Start year: 2020	End year: 2025
Type and level of Commitment		Electricity (power) sector and energy sector	
Reference year or period		Base year, 2010, emissions ≅ 20 Gg C02 eq	
Estimated, quantified emissions impact		Reduce GHG emissions by 100% from the electricity sector by 2025 Reduce GHG emissions from energy sector by 60% below 2010 level by 2025	
Coverage	% National emissions (as at 2015)	Approximately 100%	
	Sectors	Energy -Electricity generation -Transport -Other (cooking) Agriculture Waste	
	Gases	Carbon dioxide (CO_2) and methane (CH_4). Others are negligible	
	Geographical	Whole of country (includes all outer islands)	

Tuvalu		27 November 2015
Parameter		**Information**
	boundaries	
Further information, relevant to commitment type, required for the purpose of providing Clarity, Transparency and Understanding		Eg. Annual estimated reductions, methodologies and assumptions for determining BAU or intensity baseline, peaking year
Intention to use market based mechanisms to meet commitments		**NO**
Land sector accounting approach		N/A
Metrics and Methodology		Consistent with methodologies used in Tuvalu's Second National Communications (currently being finalised) using the 1996 IPCC Guidelines for GHG Inventory.
Planning Process		Tuvalu adopted an all-inclusive process of engaging relevant stakeholders through bilateral consultations and workshops. The first workshop involving key Departments and Ministries provided much needed awareness about INDCs and the provision of additional data/information. It strengthened the whole-of-government process by providing national ownership of the INDC, as well as helped realise the synergies between other processes, including National Communications, National Energy Policy, National Strategic Action Plan for Climate Change and Disaster Risk Management (2012-2016), Master Plan for Renewable Energy and Energy Efficiency in Tuvalu (2012-2020), National Strategic Plan and externally funded development projects in related areas. The second national consultation was used for the validation of the proposed targets contained in Tuvalu's INDC, before it was presented for approval by National Advisory Council on Climate Change (NACCC) and endorsement by Cabinet prior to its

Tuvalu	27 November 2015
Parameter	**Information**
	submission to UNFCCC.
Fair and Ambitious	Tuvalu's emissions are **less than 0.000005%** of global emissions, one of the lowest from any Parties, negligible in the global context. The import of fossil fuels into the country is used as proxy for the GHG emissions. The total fuel imports remained almost constant at around 3500 kL, from 2001 – 2012. It declined by about 14% in 2013, but increased by approximately 23% in 2014 mainly due to the increase in the number of ships servicing the outer atolls. However, the figures for 2015 are showing significant decline in emissions due to the installation of new solar PV systems. Tuvalu is the world's second lowest-lying country and sea level rise poses a fundamental risk to its very existence. Climate change through rising temperatures and irregular rainfall are already impacting on income from fish and crops. In this context, the target of zero dependence on important fossil fuels for electricity generation by 2025, cannot be more ambitious. Moreover, its targets to reduce emissions from the other energy sectors, mainly transport, are significant given that this is one of the most rapidly growing sources of carbon emissions.

Background Information on Tuvalu's INDC

General

Tuvalu archipelago comprises nine small islands, six of them being atoll islands (with ponding lagoons) namely Nanumea, Nui, Vaitupu, Nukufetau, Funafuti and Nukulaelae. The remaining three islands, Nanumaga, Niutao, and Niulakita are raised limestone reef islands. All the islands are less than five metres above sea level, with the biggest island,

Vaitupu, having a land area of just over 524 hectares. The total area is approximately 26 km^2 with an EEZ of 719,174 km^2.

Tuvalu is a Least Developing Country with a per capita income of less than USD4000, and is the smallest of any independent state. According to a World Bank (2013) report, Tuvalu's gross domestic product (GDP) was estimated at USD 39.7 million in 2013 and was the smallest of any independent state. GDP growth in the past was volatile and this is expected to continue into the future due to Tuvalu's dependence on fishing and internet domain licensing fees, remittances, and trust fund returns, all of which are dependent on exogenous factors beyond the government's control. Due to the small population and lack of land area and resources, the scope for economic diversification, including exports, is minimal. Nearly everything, including skilled services, is imported. Fuel and food constitute nearly half of total imports of goods.

Mitigation

Greenhouse Gas Emissions

According to Tuvalu's draft Second National Communications, the Energy sector is the major contributor to CO_2 emissions (100%). The Waste sector is the main contributor of CH_4 emissions (74.7%) followed respectively by the Agriculture sector (24.7%). On a mass basis, emissions of CO_2 are the most important. This is largely due to the importance of fossil fuel combustion as a source of CO_2. Land-use change and forestry, is not an important CO_2 source in Tuvalu. In terms of carbon dioxide equivalent, Tuvalu's gross aggregated GHG emissions (not including the LUCF sector), across all sectors, totaled 16.95 Gg CO_2-e in 2002 and the net GHG emissions (including the LUCF sector) were practically the same figure (16.92 Gg CO_2-e).

Within the energy sector, emissions from electricity generation contribute to 41%, transport sector 40% and the remaining 18% from other sectors.

One of the many constraints to development is Tuvalu's high dependency on imported energy resources, primarily petroleum products. Tuvalu has no conventional energy resources and is heavily reliant on imported oil fuels for transport, electricity generation and household use. High fuel prices and fluctuations have a destabilizing effect on businesses and households, limiting growth and reducing food security, especially in the most isolated outer islands.

Renewable energy resources such as solar, wind, biomass and ocean energy are recognized as potential energy alternatives in the country. In response to the world oil market and to ensure enhanced energy security, the Government of Tuvalu (GOT)

committed to get 100% of its electricity from renewable energy sources by 2020. The Tuvalu National Energy Policy (TNEP), formulated in 2009, and the Energy Strategic Action Plan defines and directs current and future energy developments so that Tuvalu can achieve the ambitious target of 100% RE for power generation by 2020.

Tuvalu's Master Plan for Renewable Energy and Energy Efficiency (TMPREEE), 2012-2020, outlines the way forward to generate electricity from renewable energy and to develop an energy efficiency programme.

It has two stated goals:

1. To generate electricity with 100% renewable energy by 2020, and
2. To increase energy efficiency on Funafuti by 30%.

According to TMPREE, Tuvalu must develop 6 MW renewable energy electricity generation capacity in the next eight years. The initial capital cost of solar arrays, wind turbines and batteries to replace the current energy demand is estimated to be A$52 million.

By the end of 2012, the output capacity of renewable energy electricity generation using PV technology totaled a mere 146 kW (peak). There has been a steady increase in installations over the last three years and the country is tracking well in terms of meeting most of its target by 2020. The remaining time will be used to make any shortfall due to production efficiencies, weather conditions (that will affect available renewable resources) and other demands from the consumers.

Large scale implementation of energy efficiency improvements will also help reduce the electricity demand. Given the steady and continuing increase in the price of diesel oil, the renewable electricity and energy efficiency programme will not only be cost effective but will ensure that affordable electricity is available to the people of Tuvalu.

It is estimated that following the completion of the renewable electricity and energy efficiency programme, the use of the diesel generator plant will reduce by up to 95% with a consequent reduction in diesel fuel consumption. Savings in diesel fuel over the 30 year life of the overall programme are estimated to be A$152 million (2011 dollars) assuming oil prices continue to increase at the current long term trend. After allowing for battery replacements and other maintenance, which are estimated to cost A$115 million, the net saving over the 30 year programme will be A$37 million.

Whilst the focus in renewable energy has largely been the solar through PVs, Tuvalu is ready to embrace other technologies, for example harnessing ocean energy, once these become available and affordable.

Planned Mitigation Actions

1. Renewable Energy

To meet the above objectives, electricity will be generated using renewable energy in all the nine islands of Tuvalu. The Outer Islands are being developed as a priority because fuel transportation from Funafuti increases the cost of generation and has environmental risks associated with potential fuel spill. Furthermore, the Outer Islands generate 18 hours a day (rather than 24 hours) and the power systems are less reliable.

On Fogafale, the main island of Funafuti atoll, due to the high population density, available land is scarce and ground-mounting of the proposed photovoltaic (PV) arrays that will form the major component of the renewable electricity system, is not considered practicable. In order to provide the required area for the PV arrays, in 2011 the Tuvalu Electricity Corporation (TEC) announced the "1000 Solar Roof Programme". In this programme, about half of the current roof space of the buildings in Funafuti will be occupied by PV arrays. In the case of the Outer Islands where more ground space is available, it is likely that a mix of roof mounted and ground mounted arrays will be adopted.

Initially the renewable electricity programme in Funafuti will comprise of the installation of PV arrays with battery storage because this technology is well proven in Tuvalu. In the early stages of the programme, a detailed investigation examined the feasibility of wind turbine generation in Funafuti as wind generation could offer significant technical and economic benefits. Wind measurements in several parts of Funafuti, show good potential for wind energy. Under a World Bank project proposal (described below) wind turbines will be installed from 2016 onwards. A wind-solar mix will optimise the level of battery storage required and the level of diesel generation required.

The system will require standby diesel generation to provide a back-up to the renewable energy when prolonged weather conditions limit renewable energy generation. Conversion or replacement of the existing diesel generators to run on bio-diesel fuel was proposed to take place in the last stage of the renewable electricity programme. It is estimated that 5% of the annual electricity production will be supplied from bio-diesel generation. This, however, is incumbent upon the development of a master plan for the coconut industry.

The following Tables summarises the status of the various Renewable Energy Installations

Table: Summary of Power systems in Tuvalu

Stations	Diesel Capacity (kW)	Solar Capacity (kW)	Comments
Nanumea	144	195	actual output approx. 90%
Nanumaga	144	205	actual output approx. 90%
Niutao	144	230	to be online by end 2015
Nui	120	60	actual output approx. 60%
Vaitupu	144	400	to be online by end 2015
Nukufetau	120	77	actual output approx. 60%
Nukulaelae	60	45	actual output approx. 60%
Funafuti	1200	735	connected to grid, no storage
Total	**2076**	**1947**	
Proposed World Bank Project 2015/2017			
Solar		925	
Wind		200	
	2076	**3072**	**5148**

2. Energy Efficiency

Energy efficiency improvements will be initially targeted on Funafuti. Funafuti has a higher power demand per capita than the outer islands and also consumes 85% of the electricity generated by the Tuvalu Electricity Corporation (TEC). Meeting the 30% target will allow Tuvalu to maintain current generation levels over the next eight years at 2% annual growth of GDP. The energy efficiency programme will include public education, energy audits and technology improvements.

A proposed **World Bank project** is aimed at providing additional energy generation from solar PV and will include investment in modest wind-power capacity. Even if, for various reasons, the role of wind in Tuvalu's future power mix is likely to be smaller than solar PV, it will serve as an important capacity building in this technology for TEC. The solar PV investment will provide sufficient battery storage and a power-conditioning system to ensure grid stability, as intermittent RE sources become an increasingly dominant portion of Fogafale's power mix.

In addition, the project will finance strategic EE investments in the largest electricity-consuming sectors. These investments could significantly reduce the need for future investments on the generation side. Moreover, the project will bring a longer-term perspective on RE investments from all sources by including battery storage and grid-forming inverters that represent major investments but are critical for long-term grid stability. Thus, this project will facilitate the planned and other future incremental RE additions without leading to grid instability and other system problems that would seriously set back the country's plans toward achieving the goal of 100 percent penetration of RE in the future.

3. Plans, Policies and Regulations

Under a proposed Energy Efficiency Act, The Government of Tuvalu will introduce legislation to promote energy efficiency, and control the importation, use and sale of inefficient electrical appliances into the country. Under the Energy Efficiency Regulations, 2015, which will come into effect on 1 January 2016, Minimum Energy and Performance Standards and Labelling (MESPL) will determine importation and use of appliances and goods. This is in line with GOT's objective to promote energy efficiency, energy conservation and the use of renewable sources of energy as part of Tuvalu's obligations under the UNFCCC and related conventions.

Means of Implementation

The Government of Tuvalu believes that climate change is real and is the greatest threat to its low lying atolls and people. Negative effects are already taking place and these will gravely undermine efforts towards sustainable development and threaten the survival and the sovereignty of the nation and her people. While longer term impacts such as sea level rise could result in the unavoidable out-migration of some of her people, they have a right to pursue any and all means to ensure their nation survives and the legacy remains, with future generations living productive lives on these islands.

Climate change is a cross-cutting development issue as it affects every aspect of the Tuvaluan way of life and livelihoods. Climate change impacts exacerbate existing cultural and socio-economic vulnerabilities. These impacts threaten the security of the nation. To this end, the people of Tuvalu must collectively build and strengthen the nation's resilience to combat climate change. However, this cannot be done alone and in isolation; regional and global cooperation is imperative to put Tuvalu on a pathway to climate change resilience and sustainable development.

Tuvalu is of the view that the scientific underpinnings of the discussions on climate change are clear in defining impact thresholds. Therefore, international cooperation is required. Any failure to reach an agreement to radically cut emissions would jeopardize Tuvalu's development and survivability.

Tuvalu continues to revise its policies in energy, climate change and the electricity sector in line with its sustainable development as contained in the National Strategic Development Plan. The significant costs of imported fossil fuels are a major factor in Tuvalu's balance of payments. Whilst Tuvalu continues to take actions to reduce its fossil fuel import bill, thereby reducing its carbon footprint, it will underscore the need for support to assist in its ambition for transforming the energy sector to non-carbon sources through greater use of renewables such as solar and wind and use of transformational technology.

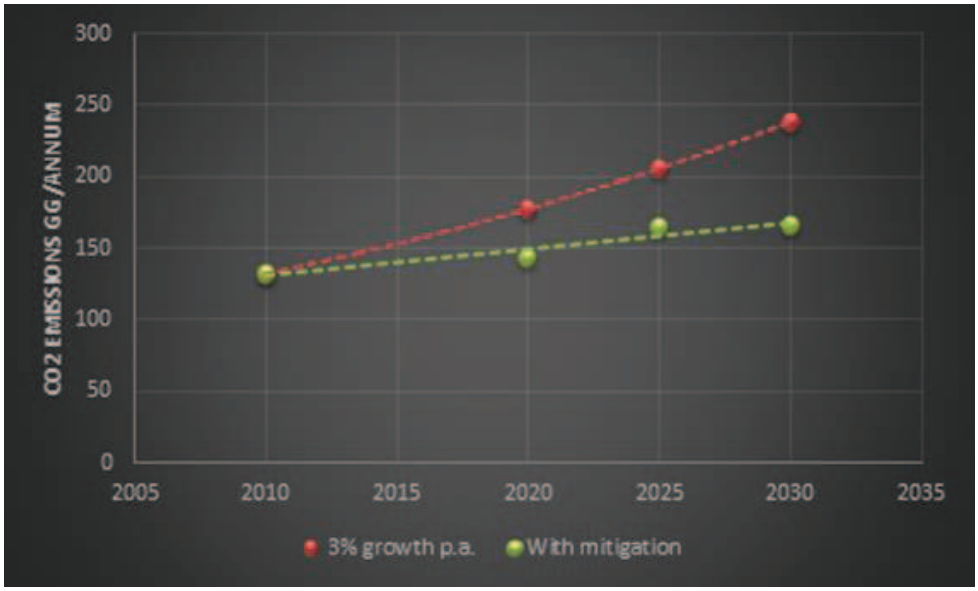
Tuvalu's INDC includes unconditional, conditional and aspirational contribution to reducing emissions. The unconditional contribution includes actions that Tuvalu has already undertaken through renewable energy programmes to reduce, significantly, its reliance on imported fossil fuels for electricity generation. It will continue to push, through other measures such as conservation, education and energy efficiency and other measures, recognizing its extreme vulnerability to the impacts of fossil fuel prices. These comprise approximately a quarter of the total imports, and any reduction in the energy bills would assist in diverting development funds to other priority areas such as poverty reduction.

International support is crucial to enable Tuvalu implement further actions enshrined in its Policies and Plans, including at sectorial level. For example, the growing emissions in the transport sector, as evidenced from the increased numbers of vehicles on land and vessel for sea transport, needs to be addressed through technological innovations. The goal to pursue a zero carbon development pathway by 2050 is dependent on availability of finance and technology.

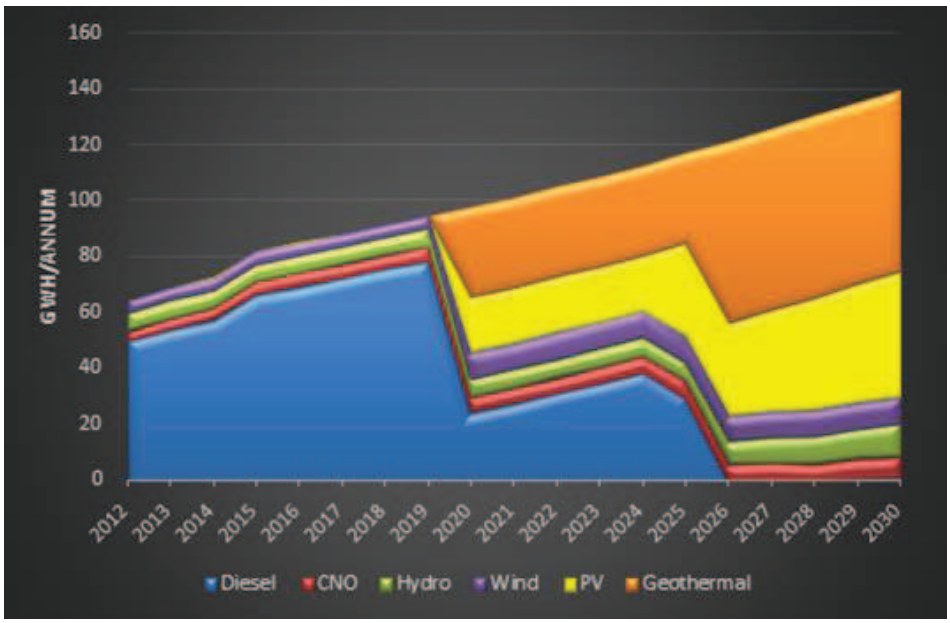
REPUBLIC OF VANUATU

INTENDED NATIONALLY DETERMINED CONTRIBUTION (INDC)

The main mitigation contribution is to achieve the outcomes and targets under the National Energy Road Map (NERM) and Second National Communication (SNC) extended to 2030. The mitigation contribution for the Vanuatu INDC submission is a sector specific target of transitioning to close to 100% renewable energy in the electricity sector by 2030. This target would replace nearly all fossil fuel requirements for electricity generation in the country and be consistent with the National Energy Road Map (NERM) target of 65% renewable energy by 2020. This contribution would reduce emissions in the energy sector by 72Gg by 2030. Emissions in this sector were around 130 Gg in 2010 but are expected to rise to 240 Gg by 2030 (3% per annum).



The mitigation would thus reduce BAU emissions in the electricity sub-sector by 100% and in the energy sector as a whole by 30%. The target would be conditional, depending on funding commensurate with putting the transition in place being made available from external sources. In addition, Vanuatu will pursue the other mitigation measures in the Vanuatu National Energy Roadmap (2013- 2020), the Scaling Up Renewable Energy in Low Income Countries (SREP) report and Vanuatu's Renewables Readiness Assessment (RRA) report undertaken by IRENA. These measures would include a vigorous program of energy efficiency to reduce emissions in all sectors except agriculture and forestry by 15%. The transition to renewable energy based electricity could be accelerated through review and revision of agricultural (coconut oil sector) national policy. Opportunities for reducing the high emissions levels in agriculture will simultaneously be pursued with cooperative programs with nations having similarly high emissions in this sector. The forestry sector mitigation will be attended to as part of the existing REDD+ program. The Government is also aware that waste management is an other area that need attention.



The adaptation component of the INDC does not seek to set adaptation targets for Vanuatu however it provides an opportunity to reiterate the adaptation priorities as identified and prioritised in key national documents such as the National Adaptation Programme of Action (NAPA) and the National Climate Change and Disaster Risk Reduction Policy.

The NAPA process identified and prioritised adaptation priority needs that were urgent and immediate - those needs for which further delay could increase vulnerability or lead to increased costs at a later stage. The five NAPA priorities include: Agriculture and food security; Sustaiable tourism development; Community based marine resource management; Sustaiable forest management and Integrated water resource management. The National Climate Change and Disaster Risk Reduction Policy identifies five key adaptation strategic priorities and associated actions to further enhance the national adaptation efforts and build resilience across sectors which include the need for: Climate Change vulnerability and multi sector impact assessments; Integrated climate change and disaster risk reduction; Community based adaptation; Loss and damage and Ecosystem based approaches.

National Circumstances

The Republic of Vanuatu is an island nation located in the Western Pacific Ocean. The country is an archipelago of over 80 islands stretching 1,300 kilometres from North to South. Vanuatu's terrain is mostly mountainous, with narrow coastal plains where larger islands are characterised by rugged volcanic peaks and tropical rainforests. Vanuatu is located in a seismically and volcanically active region and has high exposure to geologic hazards, including volcanic eruptions, earthquakes, tsunamis and landslides.

Vanuatu's national vision as per the Government's Priority and Action Agenda (PAA) 2006-2015 is "An Educated, Healthy and Wealthy Vanuatu". The goal of the Government of Vanuatu (GoV) is to raise the welfare of its people, and main agendas for action include growing the productive sector, especially agriculture and tourism, maintaining macroeconomic balance, raising public service performance, cutting costs associated with transport and utilities, and improving access to basic services such as health and education. Government of Vanuatu is also committed to achieving MDG goals and targets and significant progress has been made towards achieving the MDG Goals.

Climate change and changing weather patterns are already having a negative impact on all the priority sectors in Vanuatu and most evidence points to the fact that they will be exacerbated by climate change related events in the future. Climate related disasters are one of the main hindrances to economic development in Vanuatu and this will certainly continue.

Vanuatu is one of the countries most vulnerable to climate change among the other Pacific island nations. The effects of climate change on agriculture production, fisheries, human health, tourism and well-being will have the consequences of decreasing national income while increasing key social and infrastructure costs. Climate change may affect all areas of life for Ni-Vanuatu people and impact women, men and young people in different ways.

Vanuatu has positioned itself as a regional leader in the fields of Climate Change (CC) and Disaster Risk Reduction (DRR) and has been widely applauded for its initiative to establish a National Advisory Board for Climate Change and Disaster Risk Reduction (NAB) as a means of improving coordination and governance around the two issues. Vanuatu's implementation of the UNFCCC has progressed exponentially in recent years as government sector agencies become more organized and civil society, academic, the private sector, development partners and regional agencies have stepped up their activities in Vanuatu.

Vanuatu is committed to formulating strategies, national policies and best practices for addressing GHG emissions and making a practical contribution to the global mitigation efforts. While at the same time the country is also pursuing its national and regional development priorities and sustainable development objectives. The development objectives are planned to be achieved by integrating GHG abatement efforts with other social, environmental and economic priorities.

Mitigation Contribution	
Time Frame	2020 - 2030
Type of Contribution	Sectoral commitment focussed on a transition to renewable energy in the electricity generation sub-sector under energy generation.
Target Level	To approach 100% renewable energy in the electricity sub-sector contingent upon appropriate financial and technical support made available
GHG Reductions	100% below BAU emissions for electricity sub-sector and 30% for energy sector as a whole.
Sectors	Mainly electricity generation sub-sector but with ancillary mitigation possible in forestry, agriculture, transport and energy efficiency sector wide. The key planned mitigation interventions include: • Doubling of the wind installed capacity to 5.5 MW by 2025 • Installing 10 MW grid connected solar PV by 2025 • Commissioning the proposed first stage 4 MW Geothermal plant by 2025 • Adding 10 MW grid connected solar PV by 2030 • Commissioning the second stage 4 MW Geothermal plant by 2030 • Substituting and/or replacement of fossil fuels with coconut oil based electricity generation The proposed interventions would need substantial external funding of around US$180 million to proceed at the time frame needed. In addition, substantial technology transfer would be required including institutional support and training. Additional planned mitigation interventions include: • National Energy Road Map (US$ 210.5 million indicative - with some overlap) • Rural Electrification Nationally Appropriate Mitigation Action (NAMA) (US$ 5 million indicative) • Off grid renewable energy projects under Scaling Up Renewable Energy in Low Income Countries Program (US $34.2 million) • Energy efficiency measures to be pursued across the board to enable 15% savings in the energy sector. • Forestry sector measures to reduce deforestation and promote good land care to accepted mitigation practices according to REDD+ • Planned cooperation with New Zealand and other nations interested in mitigating methane (CH_4) and associated emissions for ruminant and pasture management

Gases	Carbon Dioxide (CO_2)
Methodology	The electricity sector emissions were analysed using data from the utilities, customs department and relevant assessments, studies and reports from development partners and civil society organizations. The data for electricity generation were entered into the GHG emission estimation model and converted to CO_2 emissions using standard conversion factors. The extrapolated data from the above sources suggests the kWh consumption in the electricity sector will rise at 3.6% per annum until 2020 after which a slightly lower growth rate is used to give an average increase of 3% until 2030. Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories and UNFCCC software "Non Annex 1 National Greenhouse Gas Inventory Software, Version 1.3.3 was used for the GHG inventory. Sectoral data for GHG estimation compiled from various sources primarily using national data collected from annual reports, statistical reports, studies and brochures of related department/institutions. The projections of emissions data to 2010 was reported in the SNC from similar data sources as the 2000 data and has a similar uncertainty analysis.
Planning Process	Vanuatu's INDCs is well aligned with the Government's Priority Action Agenda Policy Objective 4.5 which is most relevant to Climate Change and states, "to ensure the protection and conservation of Vanuatu's natural resources and biodiversity, taking climate change issues in consideration." The contribution is also based on the research undertaken for a number of national initiatives including the Vanuatu National Energy Roadmap (2013- 2020), the Scaling Up Renewable Energy in Low Income Countries (SREP) report, Rural electrification NAMA design document by UNDP MDG Carbon and Vanuatu's Renewables Readiness Assessment (RRA) report undertaken by IRENA . In addition, relevant data and information has been used from the Government of Vanuatu and various private and civil society organizations. Extensive consultations with all relevant stakeholders were held during the preparation of Vanuatu's INDC.
Adaptation Priorities and Goals	
Priorities	For Vanuatu, as an LDC, the National Adaptation Programme of Action (NAPA) process identified and prioritised adaptation priority needs that were urgent and immediate - those needs for which further delay could increase vulnerability or lead to increased costs at a later stage. The Vanuatu NAPA identified 11 top adaptation priorities through a national consultation process. These adaptation priorities were further refined to include 5 top priorities for support and implementation. The 5 NAPA priorities include: 1. Agriculture and food security 2. Sustaiable tourism development 3. Community based marine resource management 4. Sustaiable forest management

	5. Integrated water resource management Out of the 5 top priorities, Least Developed Countries Fund (LDCF) financing has been sourced to further elaborate and implement priorities 1 and 5 while a concepts for 2 is being developed. Health, which is among the 6 priorities was not selected for concept development however given interest from key implementing agencies, financing from the LDCF has been secured for concept development and implementation. The NAPA further recognised that the following core issues were relevant to all priorities and should be an integral part of any proposed activities; a. Awareness raising at all levels b. Capcity building including institutional capacity c. Research and development d. Promotion of appropriate traditional knowledge and pracitces e. Technology Transfer f. Education and training g. Mainstreaming of climate change and disdaster risk reduction h. Consideration of marine and terrestrial Biodiversity issues The National Climate Change and Disaster Risk Reduction Policy identifies 5 key adaptation strategic priorities and associated actions to further enhance the national adaptation efforts and build resilience across sectors. These strategic priorities from 2015 to 2020 include the need for: 1. Climate Change vulnerability and multi sector impact assessments 2. Integrated climate change and disaster risk reduction 3. Community based adaptation 4. Loss and damage 5. Ecosystem based approaches Please see annex for detailed information.
Support Needed	<u>Financial</u> The Climate Public Expenditure and Institutional Review (CPEIR) report for Vanuatu states that Vanuatu has been receiving a lower share of adaptation funding than most other Pacific island countries. To adequately adapt to the impacts of climate change, starting now, the annual cost is estimated to be 1.5% of a country's GDP. For Vanuatu, this equates to an investment of US$9.5million per year. This is substantially higher than the amount of development funding currently being spent on projects that have Adaptation as their principal objective. In coming years, greater levels of donor funding are likely to be available for climate change adaptation as the economies and budgets of Developed Countries recover from the Global Financial Crisis. As well, as a Least Developed Country, Vanuatu is likely to benefit from the United Nations goal of promoting at least half of these countries to 'Developing Country' status by 2019.

	To be in a better position to take advantage of CC/DRR funding that will become available, Vanuatu is establishing strong, efficient and sustainable governance arrangements, and demonstrating a track record in maintaining these arrangements. Ministry of Climate Change is also targeting National Implementing Entity (NIE) accreditation, which will also give it direct access to funding from the Adaptation Fund and potentially other sources of funding for climate change such as the Green Climate Fund. <u>Technical</u> A Technology Needs Assessment (TNA) for Vanuatu is needed as a matter of priority to look at implementing a country driven process for identifying and analysing the priority technology needs for mitigating and adapting to climate change. Carrying out the TNA could provide an opportunity to realize the need for new techniques, equipment, knowledge and skills for mitigating greenhouse gas (GHGs) emissions and reducing vulnerability to climate change. <u>Capacity</u> At the policy and legislative levels a number of legislative changes are required to reflect the current climate and disaster governance arrangements and clarify the full range of climate and disaster risk responsibilities. Among these are the National Disaster Management Act and the Vanuatu Meteorology Act. At the corporate level the Ministry of Climate Change needs to develop a long term cooperate plan to guide the implementation of its responsibility and also to further guide the agencies under its remit. Agency level cooperate plans are already in existence but lack strong links between the various departments. At the institutional level the need to streamline and strengthen the NAB and its Secretariat is a priority. At the human resource level, no systematic assessment has been carried out to understand the required skills set, existing skills set and the gaps for implementing CC/DRR initiatives. No human resource development plan has been developed. Most training is ad hoc in nature and not linked to a formal professional development strategy. At the information and knowledge management level, systems exist but are not fully utilised. This makes information sharing and learning of lessons difficult. Further, Vanuatu continues to face several barriers as it strives to meet its UNFCCC and the Kyoto Protocol obligations. The various obstacles include insufficient institutional and financial resources; lack of research data; information management problems and; inadequate human resources and infrastructure. More must be done to build awareness both within the Government and the community about Vanuatu's vulnerability to climate change. There is also an apparent need to feed information, knowledge and technologies to enable improved decision-making and environmental management.
Monitoring and Evaluation	The monitoring and reporting on the adaptation activities of the INDC will be conducted at the Ministry level by the CCDRR PMU in close collaboration with the M&E unit of the Prime Minister's Office, as is

	the current practice with projects being implemented under the oversight of the NAB. This will ensure that achievements in the implementation of the INDC priorities are appropriately captured and reported on in the Government's Annual Development Report prepared by the Prime Minister's Office.
Fairness, Equity and Ambition	
Fairness, Equity and Ambition	Small Island Developing States (SIDS) has been recognised by the United Nations Framework Convention on Climate Change (UNFCCC) and Intergovernmental Panel on Climate Change (IPCC) as the most vulnerable countries to face the effects of climate change. Vanuatu being a part of SIDS share similar challenges. Vanuatu anticipates many impacts from climate change on its society, economy, environment and human health and Vanuatu through the Ministry of Climate Change is actively cooperating with United Nations agencies and international partners to assess these effects and develop appropriate plans through climate change adaptation and mitigation. Vanuatu's adaptation plans and programmes intends to support progress towards the country's national development priorities and the goal of environmental sustainability, by ensuring that a focus on reducing vulnerabilities and risks is incorporated into planning and activities across all sectors of the economy and society. Vanuatu is also keen to reduce its reliance on fossil fuels for the energy needs. The National Energy Road Map, which sets out a clear strategy and action plan for the development and use of alternative and sustainable energy sources, has an ambitious goal of reducing the country's high reliance on imported fossil fuel by meeting 65% of its electricity needs from renewable energy sources. Vanuatu's past emissions have been miniscule and have only become locally significant in the past decade or two. In general development issues dominate rather than climate change mitigation. Vanuatu is a small developing nation with absolute levels of CO_2 eq emissions very small at under 0.0016% of world emissions. The country is also one of the most vulnerable to the effects of climate change and has much to lose should the worst predictions from increased temperature levels eventuate. As such the country will do its best to mitigate but would require financial, technical and capacity building support to do so.

Annex

National Adaptation Programme of Action - Priorities
• Agriculture and food security • Development of resilient crop species including traditional varieties • Land use planning and management • Water resource management • Sustainable forest management • Marine resource management and aqua culture • Climate change and infrastructure • Sustainable livestock farming and management • Integrated coastal zone management • Sustainable tourism development • Vector and water borne disease management

Strategic Priority – Climate Change Adaptation and Disaster Risk Reduction	
Strategy	**Actions**
Climate Vulnerability and Multi- Sector Impact Assessment	Enhance efficiency and effectiveness of adaptation action and design action to address explicit climate impacts in specific sites through: • Vulnerably assessments and risk mapping using multi-hazard approaches as the basis of all adaptation action, conducted prior to implementation with communities and in a participatory, free and informed way • Adaptation, appropriate to local communities, being a research priority for all actors, including scientific research, farmer-based trials, traditional indicators and observation systems and demonstration sites • Selecting and prioritizing actions based on criteria including effectiveness, efficiency, efficacy, and cost effectiveness using internationally recognized tools (e.g. environmental impact assessment, cost benefit analysis) and locally utilized processes • Adaptation decisions being based on relevant data and information using already available data, statistics and processes • Data and information on adaptation being shared with and incorporated into centralized systems (eg NAB portal) Adopt multi-sectoral approaches and address complex impacts through: • Considering adaptation information from multiple sectors and knowledge systems to avoid maladaptation that may result from a narrow, single sector adaptation focus • Considering urban and rural adaptation issues equally and fairly in national adaptation planning and action based on vulnerability criteria

Integrated Climate Change Adaptation and Disaster Risk Reduction	Relevant initiatives and programs must include an integrated climate change adaptation and disaster risk reduction approach through: • Strategic documents at all levels including both climate change and disaster risk elements in an integrated and compatible way (e.g. government policies, provincial plans, community strategies, municipal plans, donor project designs, budget frameworks) • Government agencies, CSOs, private sector and academia taking responsibility for identifying their adaptation priorities and incorporating these into their policy, strategic documents, and budgets to implement adaptation and disaster risk reduction action • Initiatives endorsed by NAB adhering to an integrated approach • Formal and non-formal education programs and curriculums incorporating an integrated approach
Community Based Adaptation	Adaptation action in communities addresses real, current and priority vulnerabilities through: • Community vulnerability assessments and comprehensive profiles being undertaken prior to project implementation • The community being fully engaged in, participate in and lead vulnerability assessment process in an appropriate language (e.g. colloquial languages, Bislama) Build on and strengthen traditional and customary systems by: • Building on and working within traditional knowledge and values so that these systems become more robust, with linkages and synergies with scientific knowledge, thereby avoiding maladaptation Adaptation is owned and driven by communities through: • Adaptation implementation plans and actions being developed and driven by the community itself, following its own planning processes that are context specific • Existing community engagement, governance and implementation structures and traditional systems being adhered to and strengthened through adaptation initiatives
Ecosystem Based Approaches	Support ecosystem function and services through action and planning by: • Embedding action and planning within an ecosystem, strengthening all interrelated parts and components (social, biological, economic) • Prioritizing action incorporating threats and solutions from the ridge to the reef of island communities (e.g. waste management) • Adaptation action building on and incorporating taboos, conservation areas and locally managed

	areas and protects vulnerable habitats and ecosystems and carbon sinks will be prioritized • Quantifying and building into adaptation planning and budgeting the value and benefit of ecosystem services • Identifying and minimizing negative impacts on the environment from adaptation activities under Vanuatu's legislation and international practices • Developing advocacy and educational programs for all stakeholders at all levels around the value of ecosystem based adaptation • Implementing sound land use planning approaches and policy documents (eg Land Use Planning Policy, Foreshore Development Act, Physical Planning Act)