

Developing renewable energy in Pacific small island developing States

The small island developing States (SIDS) of the Pacific face unique development challenges because of their small size, remoteness from major markets, limited export base and exposure to global environmental challenges. Energy security and diversification of the energy mix have been major drivers for renewable policies and targets in the Pacific islands. This policy brief focuses on the targets for electricity generation from renewables set by Pacific SIDS and discusses the key policy considerations and challenges related to those targets. In particular, it highlights the importance of creating a conducive environment for the development of renewables and emphasizes the need to shift policy discourses from focusing on output to prioritizing access.

The small island developing States (SIDS) of the Pacific face unique development challenges because of their small size, remoteness from major markets, limited export base and exposure to global environmental challenges. Energy security is an important area of concern for these countries, with an estimated 70 per cent of their population lacking modern electricity services. These countries also rely heavily on imported petroleum fuels for electricity generation and, in particular, for the transport sector.¹

Energy security and diversification of the energy mix have been major drivers for renewable policies and targets in the Pacific islands. Although the Pacific SIDS are endowed with various renewable energy sources, they remain highly dependent on expensive fuel imports to meet their energy requirements. Therefore, increasing renewable energy investments is seen as a means to mitigate the financial risks associated with oil price fluctuations by diversifying energy supplies.

As renewable energy technologies offer considerable potential in the subregion for replacing oil-based power generation, many Pacific SIDS have set ambitious targets that focus on increasing investments and installations in the electricity sector in particular. Illustrating this, the table below compares the renewable energy targets for electricity generation set by 13 Pacific SIDS with the current renewable share of electricity generation in those countries. More than half of the countries represented in the table have targeted reaching 100 per cent electricity generation from renewables between the timeframe of 2017 to 2030. Additionally, there are worryingly large gaps between the targets and the actual current renewable share of electricity generation figures apparent in each country. Arguably, these ambitious targets have been used as a tool to influence the negotiating capacity of Pacific SIDS in discussions at the United Nations Framework for Climate Change and to encourage significant polluters

to take more serious and urgent action. Achieving these targets, however, will require a significant scaling up of renewable energy technologies in these countries as well as access to finance to support the development, operation and maintenance of them.

Table 1. Renewable energy targets of the Pacific small island developing States

Economy	Target*	Target date	Current renewable share of power generation (2014)
Cook Islands	100%	2020	50%
Fiji	100%	2030	60% (2013)
Kiribati	45% urban, 60% rural public infrastructure, 100% rural households	2025	0.0
Marshall Islands	20%	2020	5% (2013)
Micronesia (Federated States of)	30%	2020	4.3% (2009)
Nauru	50%	2020	0.5%
Palau	45%	2025	8%
Papua New Guinea	100%	2030	39%
Samoa	100%	2017	20% (2012)
Solomon Islands	100%	2030	-
Tonga	50%	2020	9%
Tuvalu	100%	2025	50%
Vanuatu	100%	2030	19% (2013)

Source: ESCAP based on Intended Nationally Determined Contributions of selected economies 2015, submitted to the United Nations Framework Convention on Climate Change, including Fiji, Kiribati, the Marshall Islands, Nauru, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu and the Cook Islands); Permanent Mission of the Republic of Nauru to the United Nations, Summary of Nauru's achievements, actions and commitments towards the three SE4ALL Objectives, document produced in New York, 2014; Republic of the Marshall Islands National Energy Policy 2014; Second National Energy Policy for the Federated States of Micronesia, Samoa Energy Sector Plan 2012-2016; Vanuatu National Energy Road Map 2013-2020, 2013.

Note: * Target refers to electricity generation.

A key concern of the high-reaching targets set by Pacific SIDS is that many of them favour investment in the electricity grid over rural electrification. The geographic isolation of Pacific SIDS has not only prevented their connection to intercontinental grids but it has also constrained rural electrification based on centralized power systems. This underscores the need to invest in renewable energy technologies in rural areas that are not connected to the grid. Lack of focus on rural energy access combined with, among other things, high upfront costs associated with rural electrification and limited government resources dedicated to rural electrification has kept the pace of rural development slow in the Pacific.

One inherent danger of the ambitious targets set by the Pacific SIDS is that low levels of demand for power in rural areas could lead to the bulk of renewable investment going into urban areas that already have access to electricity.² The focus of many targets on centralized grid systems also implies that they are less geared towards directing greater investment towards the development and utilization of off-grid, decentralized energy solutions that are especially suited for rural and, in particular, remote and hard-to-access areas where extensions of centralized grid connections are less feasible. Installation of off-grid systems is crucial in such countries as Kiribati, Micronesia (Federated States of), Papua New Guinea, Solomon Islands and Vanuatu, where geography and population dispersion hinder the expansion of centralized grid systems. In addition to installation, investment must also be directed towards advancing technical capacity in operating and maintaining off-grid electrification projects.

Concerns over such a high degree of vulnerability have been reflected in the decision of the Committee for Development Policy at its 2015 review.³ It did not recommend Kiribati for graduation, even though the country had met the graduation eligibility criteria for the second time. The Committee also postponed its recommendation of Tuvalu for graduation for the second time. Also of note, Vanuatu was initially scheduled to graduate in 2017 as it had met and continued to advance in the income and human assets criteria. However, taking into account the serious disruption caused by Cyclone Pam to the economic and social progress that Vanuatu had been demonstrating for several years, the General Assembly decided to postpone graduation until December 2020.

Such delayed processes of graduation because of natural disasters are not new to the Asia-Pacific region. In December 2004, six days after Maldives was officially removed from the list of LDCs, the Indian Ocean earthquake and tsunami, one of the deadliest natural disasters on record, struck the island country. Although Maldives was 2,500 km away from the epicenter of the earthquake, the country suffered significant damage and loss of lives. As a consequence of the tsunami, the General Assembly granted Maldives a three-year moratorium, and, in 2007, Maldives entered a three-year transition period to negotiate a gradual phasing

out of the benefits derived from being a LDC. Maldives eventually graduated in 2011. The experience of Samoa is similar. The country was scheduled to graduate in 2010, but the General Assembly extended the transition period by three years until January 2014 because of the disruption caused by the Pacific Ocean tsunami of 2009.

Policy considerations and challenges for renewable energy development in the Pacific small island developing States

Renewable energy targets of the Pacific SIDS present opportunities for widening electricity access, reducing poverty and improving the quality of life in the subregion. However, green growth through renewables in the Pacific islands is not just about increasing renewable energy installations; it is also about creating a conducive environment for the development of renewables, which includes rehabilitating existing energy sources, accelerating the utilization of emerging energy technologies and developing an innovative approach to financing renewable energy solutions. In addition, it entails achieving universal access to modern energy that is affordable, reliable and sustainable. This, in turn, requires that the right indicators be set to incentivize the energy sector and that policy discourses shift from focusing on output to prioritizing access.

Such a shift would enable national policies and financing to be more reflective of a balanced approach to energy needs, supplies and services. The ability of targets and policies to achieve universal energy access is largely dependent on an ability to assess the level of energy access. The Global Tracking Framework, a multi-agency effort led by the International Energy Agency and the World Bank, which has been adopted by the Sustainable Energy for All programme, has developed a multi-tiered energy framework to track global and national progress on energy access, renewable energy and energy efficiency in a more holistic and comprehensive way than current methods allow.

In addition to shifting priorities, many challenges must be addressed to facilitate energy sector reform through the expansion of renewable, sustainable clean energy in SIDS. Factors related to financial constraints, weak institutional mechanisms and regulatory frameworks, the availability of technology and technical capacity, as well as geographic constraints and environmental vulnerabilities are limiting the development of renewable energy resources in Pacific SIDS.

The substantial planning and investments shifts entailed in moving from high- to low-carbon investment require an enabling, robust and predictable regulatory environment and economic framework to stimulate and support effective private sector activities. Widespread deployment of the most relevant renewable energy technologies that fit with the unique geographic and environmental vulnerabilities of SIDS depends heavily on the availability of financing. While

financial assistance extended by donors and development partners will be essential in implementing proposed renewable energy projects and in improving existing infrastructure and technologies, it is also imperative that Governments take concrete measures to designate the right market signals and provide the necessary incentives to curtail the risks involved in climate-friendly investments.

A significant scaling up of renewable energy generation capacity in SIDS requires supportive legal and regulatory frameworks to address planning restrictions and grid access and allow for the efficient use of independent power producers. It also requires the removal of barriers to investment in renewable technologies and that private sector and household investment in such technology be stimulated. Governments can accelerate such investments by creating incentives that promote an increased prevalence of renewable energy in the resource mix by means of implementing fiscal policies that favour investment in renewables over traditional fossil fuels, developing clear standard specifications for renewable energy components and providing accessible funding schemes for renewable uptake.

Additionally, feed-in-tariff schemes can also be an important way for Governments to encourage uptake of renewable and low-carbon energy by offering long-term contracts and guaranteed pricing to small-scale producers of renewable energy. Such schemes generally offer a guaranteed payment to renewable energy producers per unit of energy output. They also make it easier for producers to obtain credit to invest in renewable power by providing a guaranteed income stream that reduces risks associated with lending to energy producers

Below is a list of common challenges impeding renewable energy deployment in SIDS that need to be overcome:

- a) The renewable electrification targets that many SIDS have set require that they develop adequate storage capacity for electricity. While this is expensive, it is considered necessary as it would allow renewables to become a stable source of power and also to be used to provide sufficient generating capacity during peak hours;
- b) Limited availability of energy data and lack of adequate data on the potential of hydropower, geothermal, ocean energy, wind and biomass constrain policy formulation as well as energy planning, financial planning and renewable system project development in many SIDS;
- c) Limited public awareness and knowledge of renewable energy and energy efficiency options combined with

high upfront costs for renewable technology and lack of access to credit have acted as barriers to renewable uptake, especially for households and communities;

- d) Lack of local technical capacity in installing, operating and maintaining renewable systems remains a critical hindrance to the scaling up of renewable energy technologies in SIDS. Capacity development and training activities are critical to accelerating the uptake of renewables and sustaining their generating capacities in the long term.

In addition to these challenges, geographic factors, environmental conditions and vulnerabilities necessitate that the policies, programmes and projects that SIDS pursue to expand renewable energy uptake be uniquely designed and customized to meet their individual capacity needs and available resources. Fiji, Papua New Guinea and Samoa have all set ambitious, yet appropriate, renewables targets that are cost effective given the abundant availability of low-cost renewable resources, such as hydropower, geothermal and biomass, in each country. However, such ambitious targets may not be feasible in countries with limited access to low-cost renewable energy sources. For example, while wind power is available in low islands and atolls, such as Tuvalu, Tonga and Vanuatu, low wind speeds combined with the need to ensure that wind turbines are cyclone proof make it expensive. Some other considerations warranting the need for carefully planning and diligently assessing policies, programmes and projects include: land availability; the extent of adequate transport facilities to reach remote villages and outer islands; whether and how energy systems on outer islands can be managed; and whether the terrain and population densities make grid extensions and their subsequent upkeep economically feasible.

¹ Peter Johnson, "Pacific perspectives on the challenges to energy security and the sustainable use of energy", paper prepared for the Asian and Pacific Energy Forum (APEF), Vladivostok, Russian Federation, 27-30 May 2013..

² Matthew Doman, "Access to electricity in Small Developing States of the Pacific: issues and challenges", *Renewable and Sustainable Energy Reviews*, vol. 31 (2014), pp. 726-735.

³ The Committee for Development Policy, a subsidiary body of the United Nations Economic and Social Council (ECOSOC), reviews the list of LDCs every three years and assesses which countries should be added to or dropped from the list. Their review is based on the following three criteria: (a) the income criterion; (b) the human asset criterion; and (c) the economic vulnerability criterion. During such reviews, the three indicators for each LDC are measured against specific graduation thresholds. If a country satisfies at least two of the three criteria for graduation in two consecutive triennial reviews, the Committee recommends to the ECOSOC that the country should be considered for graduation. As an alternative, the "income-only" option allows countries to graduate if their income per capita is at least twice as high as the regular income graduation threshold.

The MPFD Policy Briefs aim at generating a forward-looking discussion among policymakers, researchers and other stakeholders to help forge political will and build a regional consensus on needed policy actions and pressing reforms. Policy Briefs are issued without formal editing. The content of this issue, prepared by Heather Taylor, is in part based on material from the *Asia-Pacific Countries with Special Needs Development Report 2016* (ISBN 978-92-1-120717-0). This policy brief benefited from comments by Yusuke Tateno. For further information on this issue, please contact Aynul Hasan, Director, Macroeconomic Policy and Financing for Development Division, ESCAP (escap-mpdd@un.org).