Renewable and Sustainable Energy Reviews 58 (2016) 311–318

Contents lists available at ScienceDirect

Renewable and Sustainable Energy Reviews

journal homepage: www.elsevier.com/locate/rser

Fuelling the Pacific: Aid for renewable energy across Pacific Island countries

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ARTICLE INFO

Article history:
Received 10 November 2014
Received in revised form
11 September 2015
Accepted 17 December 2015

Keywords:
Pacific island countries
Aid/development assistance
Renewable energy
Electrification

ABSTRACT

Pacific island countries have strong economic, political and environmental incentives to switch from imported fossil fuels to indigenous renewable energy technologies, and are well positioned to achieve such a switch, given their ample renewable energy potential as well as their ambitious renewable energy goals. For the Pacific island countries to reach these goals, however, they depend on donor funding. This paper therefore analyses energy-related aid to the South Pacific from 1990 through 2012, and specifically evaluates its development in three areas: energy technology, grid vs. off-grid solutions, and project components. Using data from the Organisation of Economic Cooperation and Development, I find a recent shift in donor thinking: donors have, over the past years, put greater emphasis on renewable energy, especially hydro and increasingly solar power. Donors have also invested more in off-grid solutions – often solar-powered. Finally, donors have begun to focus more on 'software', that is, capacity-building, training and policy-making. If Pacific island countries, together with the donors, continue on this path, they are well-positioned to reach their ambitious renewable energy goals – and to serve as an example for other countries, both developing and developed, islands and non-islands.

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1. Introduction

Pacific island countries (PICS) are among the first and worst affected by climate change. At the same time, their own greenhouse gas emissions are minute on a global scale. Yet, even if greenhouse gas reductions in small island states – in the Pacific and beyond – will not be felt globally, they are important for two reasons: First, every greenhouse gas reduction counts: a ton of carbon dioxide saved is a ton of carbon dioxide saved. Second, and more importantly, small island states seek to lead by example and demonstrate to larger emitters that reductions are feasible – not least to gain credibility and moral leverage in the global climate change negotiations [e.g., 1,2].

The energy sector offers the biggest opportunity for PICS to reduce their greenhouse gas emissions, since almost all of their greenhouse gas emissions are from fossil fuels imported for power

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http://dx.doi.org/10.1016/j.rser.2015.12.156
1364-0321/

generation and transport. A switch to renewable energy, in particular for power generation, would not only improve PICs' environmental performance, but also help to reduce expensive imports and reduce vulnerability to price volatility and insecure fuel supply. Accordingly, most PICs have put forward ambitious renewable energy goals; the Cook Islands, Niue and Tuvalu, for instance, all aspire to have 100 percent renewable electricity by 2020 ([3,4]; see also Table 2).

For the PICs to reach these goals, however, they depend on external funding and aid. Renewable energy technologies typically require high upfront capital, which governments and households lack across the PICs. Donor support is thus central. But how has energy-related aid to the Pacific developed over time? This paper takes a closer look at data on energy-related aid from the Organisation of Economic Cooperation and Development (OECD) Credit Reporting System (CRS) from 1990 through 2012. After an overview of the present (renewable) energy landscape in PICs, the paper examines where energy-related aid is flowing to, in terms of renewable energy technology, grid vs. off-grid solutions, and project components. The results indicate a shift in energy-related aid over the past years: toward renewable energy, toward off-grid solutions and toward policy-making and capacity-building. Much remains to be done; yet, if the Pacific island countries, together with the donors, continue to pay attention to different renewable energy technologies, rural electrification, and 'software', they can reach their renewable energy goals – and serve as an example for other countries, in the Pacific and beyond.

2. (Renewable) energy in the south pacific

The focus here is on the 14 PICs that are members of the Secretariat of the Pacific Community (SPC). While they differ considerably in terms of land area, population and population density, geography, and gross domestic product (GDP), as Table 1 shows, these countries also share common development challenges, related to their insularity, relative remoteness, geographic fragmentation, and overall small size [e.g. 5,6].

These island characteristics also affect the energy situation in PICs, as Table 2 illustrates. In some countries, especially in the single-island countries of Nauru and Niue, almost everyone has access to electricity. In rural areas and remote outer islands, in contrast, households have only limited access to electricity. Particularly in the larger, Melanesian countries – Papua New Guinea, the Solomon Islands and Vanuatu – access to electricity is very low, at 20 percent or less. Although some households may instead have access to basic electrification through small-scale off-grid installations, many households, especially rural households, are not electrified. While national averages vary (see Table 2), overall, 70 percent of households in the Pacific lack access to electricity (50 percent if Papua New Guinea is excluded; [7]).

It is thus not surprising that in many PICs, traditional biomass, mostly wood or coconut residues, significantly contribute to primary energy needs e.g. [8]. Overall, however, imported fossil fuels dominate, as Fig. 1 clearly indicates. Energy, in particular in rural areas, is largely from diesel generators – they provide an estimated 78 percent of all (modern) energy [3]. Yet, diesel generators have several disadvantages: they often run just a few hours per day; they may be idle for long periods while awaiting repair or fuel, often from other islands [7,9]; and they are 'the most expensive form of power for most situations in the region', according to a recent International Renewable Energy report [3, page3]. Electricity is indeed extremely expensive in PICs, with electricity tariffs of on average 35 USD cents per kWh, but reaching as high as 1.50 USD per kWh in outer islands (see Table 2; [3]). High prices are due to remoteness and associated high transport costs, diseconomies of scale and small market sizes [10], and so PICs spend a significant

Table 2
Energy in the Pacific island countries.

Country	Access to electricity (%)	Fuel imports (% of GDP)	Diesel price (USD)	Electricity tariff (USD/kWh)	Renewable energy targets	
Cook Islands	97	28.0	1.63	0.44	100	2020
Fiji	60	13.3	0.70	0.17	90	2015
Kiribati	60	9.0	1.11	0.44	28	2025
Marshall Islands	75	26.6	1.48	0.37	20	2020
Micronesia (Fed. States)	54	12.5	1.25	0.42	30	2020
Nauru	100	8.5	1.55	0.14	50	2015
Niue	99	19.9	1.63	0.43	100	2020
Palau	100	11.9	0.93	0.32	20*	2020
Papua New Guinea	10	5.6	0.91	0.21	na	na
Samoa	97	16.9	0.81	0.28	10*	2016
Solomon Islands	14	16.4	0.98	0.51	20*	2020
Tonga	92	10.4	0.95	0.36	50	2020
Tuvalu	98	20.7	1.51	0.40	100	2020
Vanuatu	19	6.0	1.36	0.37	65*	2020
average	70	14.7	1.20	0.35	na	na

* Target refers to primary energy supply. Data from [4]. Access to electricity from [37]. All other data for 2009, from [38].

Table 1
The Pacific island countries.

Country	Land area (km^2)	Population (000)	Population density	GDP/cap (USD)	Geography
Cook Islands*	240	21	86	10,300	14 islands
Fiji	18,270	875	48	3612	320 islands, 106 inhabited
Kiribati	810	101	124	1160	32 widely scattered atolls
Marshall Islands*	180	53	292	2879	34 islands, mostly atolls
Micronesia (FS)*	700	103	148	2443	607 islands
Nauru	21	10	471	6954	Single island
Niue*	261	1.5	6	5800	Single island
Palau*	460	21	45	9281	596 islands, 12 inhabited
Papua New Guinea	452,860	7167	16	1076	Over 600 islands
Samoa	2830	189	67	2350	10 islands
Solomon islands	27,990	550	20	1145	ca. 1000 islands, 350 inhabited
Tonga	720	105	146	2658	176 islands, 36 inhabited
Tuvalu	30	10	329	2624	9 atolls
Vanuatu	12,190	247	20	2112	Over 80 islands, 65 inhabited

* Countries freely associated with New Zealand (Cook Islands and Niue) or the United States (Marshall Islands, Federated States of Micronesia and Palau). All data for 2012. Population density is inhabitants per km^2, GDP in constant 2010 USD.*Sources*: Land area, population and GDP data from [35] and [36]; geography from [3].