ENERGY TRANSITION INITIATIVE
Islands

Energy Snapshot
Palau

This profile provides a snapshot of the energy landscape of Palau, an independent island nation geographically located in the Micronesia region. Palau's residential electricity rates are approximately $0.28 U.S. dollars (USD) per kilowatt-hour (kWh), more than twice the average U.S. residential rate of $0.13 USD/kWh.[1] Like many island nations, Palau is highly dependent on imported fossil fuels (more than 99.7% of the island's electricity is generated using imported fossil fuels), leaving it vulnerable to global oil price fluctuations that directly impact the cost of electricity.

Palau's Renewable Energy Goals:

- 20% of electricity from renewable sources by 2020[5]
- 30% reduction in energy consumption by 2020

Population	21,186[2]
Total Area	459 sq. km
Gross Domestic Product (GDP)	$272 million USD
Share of GDP Spent on Fuel and Imports	Electricity – 6.9%[3] Total – 11.9%[4]
GDP Per Capita	$15,000 USD
Urban Population Share	86.5%

Government and Utility Overview

Government Authority	**Ministry:** Palau Energy Office, Ministry of Public Infrastructure, Industries, and Commerce	
	Key Figure: Gregorio Decherong, Director, Palau Energy Office	
Designated Institution for Renewable Energy	Palau Energy Office, Ministry of Public Infrastructure, Industries, and Commerce	
Regulator	Self-regulated	
Utility	**Name:** Palau Public Utilities Corporation	Government-owned

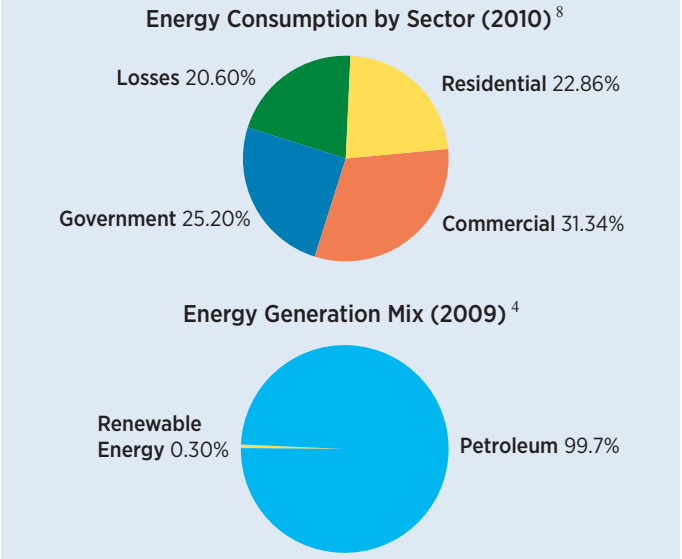
Electricity Sector Data

Palau Public Utilities Corporation (PPUC) is a government-owned utility that manages power generation and distribution in Palau. PPUC connects 98% of the households to a utility grid. The transmission and distribution network covers around 114 linear miles of 13.8–kilovolt (kV) distribution lines, which is interconnected by 47 linear miles of 34.5-kV transmission lines of an undersea cable. PPUC uses an inverted block tariff structure that starts at $0.28/kWh for residential and $0.41/kWh for commercial and government.

PPUC has an installed generation capacity of 28.05 megawatts (MW) and peak load of 15 MW, with a total annual generation of 88.75 gigawatt-hours (GWh). Currently, about 0.30% of the total electricity generated comes from solar energy. Transmission and distribution losses account for 20.06% of the generated electricity.

Electricity Sector Overview

Total Installed Capacity (2011)[6,7]	28.05 MW	
Peak Demand (2009)[9]	15 MW	
Total Generation (2011)[8]	88.75 gigawatt-hours	
Renewable Share (2009)[4]	0.30%	
Transmission & Distribution Losses (2009)[4]	20.60%	
Electrification Rate (2009)[4]	98%	
Average Electricity Tariffs (USD/kWh) (2013)[8]	**Residential**	$0.282
	Commercial	$0.405
	Government	$0.405



Clean Energy Policy Environment

The Republic of Palau endorsed its National Energy Policy (NEP) in 2010. An Energy Sector Strategic Action Plan formed a guiding document for implementation of this policy. The policy called for improved institutional arrangements; increased energy efficiency; promotion of renewable energy; an effective hydrocarbon sector; and ensuring security, reliability, and efficiency of the electricity supply. The NEP set targets to reduce national energy consumption 30% by 2020 and produce a minimum of 20% of total energy from renewable sources by 2020.[5]

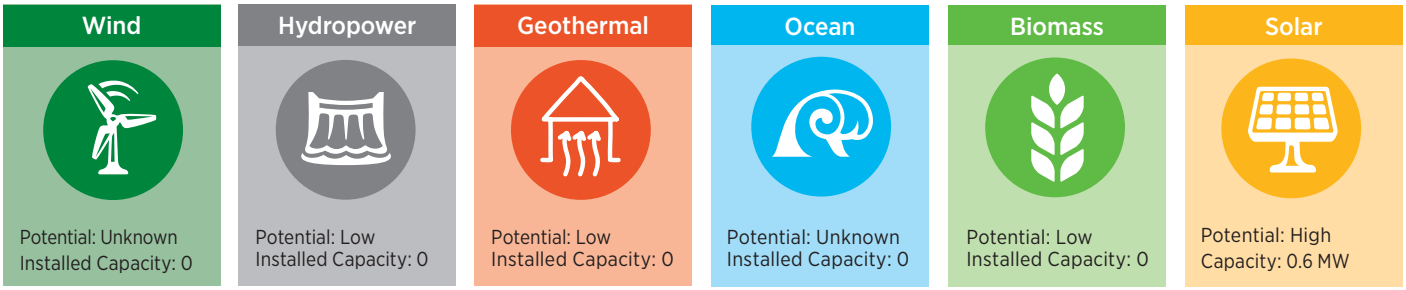
Palau initiated energy efficiency efforts to reduce governmental energy use through its Energy Conservation Strategy in 2007. In 2008, it adopted a 15-point Energy Efficiency Action Plan (EEAP) to reduce energy consumption in the public and private sector.[10] The government aims to improve energy efficiency in at least 80% of households, businesses, and government buildings in Palau by 2020.[5] The NEP encourages increased vehicle efficiency, efficient modes of transport, and travel demand management to reduce fossil fuel consumption in the transportation sector.

Existing Policy and Regulatory Framework

Renewable Energy	
Feed-in Tariff[11]	●
Net Metering/Billing[11]	●
Interconnection Standards	
Renewables Portfolio Standard/Quota	
Tax Credits	
Tax Reduction/Exemption[5]	■
Public Loans/Grants[5]	■
Green Public Procurement	
Energy Efficiency	
Energy Efficiency Standards[13]	■
Tax Credits	
Tax Reduction/Exemption	
Public Demonstration[13]	●
Restrictions on Incandescent Bulbs	
Appliance Labeling Standards[13]	■
Targets[4]	
Renewable Energy[5]	●
Energy Efficiency[5]	●

● In Place ■ In Development

Renewable Energy Status and Potential[8]



Renewable energy generation in Palau is supported by the Net Metering Act of 2009 and feed-in tariffs that encourage residential and commercial customers to install grid-connected renewable energy. The PPUC Net Metering Act provides bill credits for the excess energy generated by the customers.[11] The feed-in rate is computed on a net billing basis, which is based on such factors as connected system size, generation output, system location, and projected contribution to the PPUC grid.[12] The NEP and EEAP outline strengthening renewable energy infrastructure through development of a standardized power purchase agreement and renewable energy equipment standards, encouraging innovative renewable energy financing, increasing public awareness, and implementing a project pipeline of priority renewable energy projects.[5,10]

Energy Efficiency and Renewable Energy Projects

Experimentation with renewable energy in Palau started as early as the 1980s with solar, wind, and biomass technologies. While wind and biomass were found to be infeasible in early years, solar installations have increased their share in the energy mix. It is estimated that Palau can expand its photovoltaic (PV) penetration up to 30% of current maximum demand with special grid regulations.[8]

Palau currently boasts 600 kilowatts (kW) of grid-connected solar energy, as compared to a daily peak demand of 9–10 MW.[8] The first 6.5-kW grid-connected solar project on the Public Works Department building was funded by Japan in 2008. Notable solar installations include Palau's largest solar project, a 226.8-kW system installed at the Palau International Airport in 2011, and 100-kW grid-connected solar PV systems installed at the Capitol Complex in 2008.[13] Subsidized private financing of grid-connected solar through the National Development Bank of Palau (NDBP), initiated in 2010, has increased solar uptake in Palau.[13] Several renewable energy projects have been funded by Europe, Japan, and Taiwan, among others.

On the efficiency side, solar streetlights are installed in Babeldaob and Koror.[13] Since the 2008 Energy Efficiency Action Plan, Palau has implemented a range of energy efficiency activities, including distribution of compact fluorescent lamps to displace incandescent lamps, energy efficiency upgrades for government buildings, developing an energy efficiency demonstration building, phasing out two-stroke outboard gasoline engines on boats, awareness campaigns, and developing energy efficiency financing.[13]

Opportunities for Clean Energy Transformation

Solar has high potential for deployment in Palau within its existing net metering regulations and financing mechanisms, and could support a reduction in fossil fuel imports. To further support the growth of renewables in the region, it is critical to develop workforce and institutional capacity and clear channels for implementation of renewable energy project development.

Palau is researching the potential of wind energy, ocean thermal energy conversion, wave energy, and energy storage technologies. Ocean thermal and wave technologies are in their nascent stages, although current energy efficiency and demand-side management technologies, along with wind and solar, can help save money today.

Energy Transition Initiative

This energy snapshot was prepared to support the Energy Transition Initiative, which leverages the experiences of islands, states, and cities that have established a long-term vision for energy transformation and are successfully implementing energy efficiency and renewable energy projects to achieve established clean energy goals.

Through the initiative, the U.S. Department of Energy and its partners provide government entities and other stakeholders with a proven framework, objective guidance, and technical tools and resources for transitioning to a clean energy system/economy that relies on local resources to substantially reduce reliance on fossil fuels.

[1] http://www.eia.gov/electricity/monthly/epm_table_grapher.cfm?t=epmt_5_03.

[2] All information in this table is from the CIA World Factbook, unless otherwise noted. https://www.cia.gov/library/publications/the-world-factbook/geos/ps.html.

[3] http://www.palauopa.org/pdf/single-audits/FY%202013/Palau%20PUC_fs13%20[Final%20June%2030%202014].pdf.

[4] http://www.spc.int/edd/en/download/finish/11-reports/654-palau-energy-country-profile.

[5] http://www.palauenergyoffice.com/wp-content/uploads/2013/06/Palau-Energy-Policy.pdf.

[6] http://www.doi.gov/oia/reports/upload/U-S-Insular-Area-Energy-Assessment-Report-2006.pdf.

[7] http://ppuc.com/statementfromceo.html.

[8] https://www.irena.org/DocumentDownloads/Publications/Palau.pdf.

[9] http://www.palauenergyoffice.com/wp-content/uploads/2013/06/2009-10-Palau-strategic-energy-plan-final-draft.pdf.

[10] http://www.globalislands.net/userfiles/Palau-1.pdf.

[11] http://programs.dsireusa.org/system/program/detail/5645.

[12] http://www.ppuc.com/images/Electricity_Rates_2012_PDF.pdf.

[13] http://www.sids2014.org/content/documents/2222013Republic%20of%20Palau%20National%20ReportMAy27_2013.pdf.

Page 1 photo from Shutterstock 36379693; page 4 photo from iStock 29878236

ENERGY TRANSITION INITIATIVE
Islands

Prepared by the National Renewable Energy Laboratory (NREL), a national laboratory of the U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy; NREL is operated by the Alliance for Sustainable Energy, LLC.

DOE/GO-102015-4681 • June 2015