

Project Proposal

1. Title	Pacific Regional Data Repository for SEA4All (PRDR)
2. Objective	To support Pacific governments and their development partners working in the energy sector by facilitating access to up-to-date, reliable energy data and project information
3. Participating countries	Fiji, Kiribati, Republic of the Marshall Islands, Federated States of Micronesia, Nauru, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu, Vanuatu
4. Estimated budget	USD 1.25 million for 5 years (Jan 2015-Dec 2019)

Summary

In September 2013 in conjunction with the UN General-Assembly, 11 Pacific leaders signed a declaration to establish a Pacific Regional Data Repository (PRDR) in support of the UN Secretary-General's Sustainable Energy for All (SE4All) initiative. It is proposed that the PRDR be established with the mandate to collect energy related data directly from primary sources as frequently as the data becomes available. The PRDR would focus only on the collection and dissemination of primary data which would be collected directly from data sources to the extent possible (following consultations with each participating country). In this way the PRDR would complement the existing work of SPC and National Statistical Systems and would provide a service to Pacific island countries, development partners and energy suppliers.

A two-step approach to implementation of the PRDR is proposed. A trial period of five years would allow potential value of the PRDR to be demonstrated. Should the PRDR prove to be successful (based on external evaluation) within this 5 year timeframe, longer term institutional arrangements could be established. Two main options on the hosting of the PRDR in its initial phase of implementation have emerged through consultations: (a) Hosting within an existing regional organisation; or (b) Establishing a new, dedicated and 'lean' entity in a Pacific island country. There are advantages and disadvantages to both approaches as outlined in the technical proposal. Ultimately the hosting of the Repository may be determined by the best approach to ensure sustainability, including the availability of funding.

1. Background

Reliable and timely data is an important prerequisite for policy initiatives and for project development and implementation. This is particularly the case in the energy sector in the Pacific given the large number of new and ongoing projects with substantial investment by governments and development partners.

In September 2013 in conjunction with the UN General-Assembly, 11 Pacific leaders signed a declaration to establish a Pacific Regional Data Repository in support of the UN Secretary-General's Sustainable Energy for All (SE4All) initiative. Through the declaration Pacific governments agreed that the purpose of the collaboration is to:

- a. Strengthen the capacity of PICTs to pursue An Energy Secure Pacific, in line with the UN's SE4ALL initiative;
- b. Provide a strategic platform to share best practices and provide a safe back-up of their energy sector data and information;
- c. Help achieve universal access by all to modern energy services
- d. Help improve the affordability of energy services
- e. Help to increase the efficiency and productivity of energy generation and utilisation;
- f. Help to increase the investments on clean and renewable energy technologies.

The Pacific Regional Data Repository (PRDR) is therefore a country-driven initiative. ESCAP has agreed to facilitate the process of establishment of the PRDR, including a feasibility and design stage. The development of this proposal has been a year long process with discussions at a number of expert, inter-governmental, ministerial and leaders meetings including:

- Suva Expert Group meeting on Energy Affordability (February 2013)
- Tonga Pacific Energy Leaders Summit (March 2013)
- Asian and Pacific Energy Forum in Vladivostok (May 2013)
- 44th Pacific Islands Forum in Majuro (October 2013)
- Suva Experts meeting on the PRDR (December 2013)

This proposal has been prepared for the consideration of senior officials and Ministers at the SPC-convened Energy and Transport Ministers Meeting being held in Nadi from 31 March to 4 April 2014. It has been developed by ESCAP with the assistance of Dr. Herbert Wade, an independent consultant who undertook missions to Tuvalu (21-25 January 2014), Kiribati (26 January to 2 February 2014), and Vanuatu (4 - 7 February, 2014)¹ to help determine the feasibility of the PRDR through interviews with key stakeholders in those countries.

¹ Tuvalu, Kiribati and Vanuatu were selected for country visits due to their status as Least Developed Countries (LDCs), in addition to being Small Island Developing States (SIDS). They also represent one country each from Melanesia, Micronesia and Polynesia.

2. Problem analysis

With the exception of PNG, Fiji and Samoa where there is substantial power generation from hydro resources, the great majority of energy used in the Pacific Island Countries is from petroleum imports. The volatility of petroleum prices and their long term increase over the past 15 years has caused petroleum imports to be a major factor in slowing economic development in the PICs. Several of the countries now have comparable or greater costs for importing petroleum products than the value of their exports and in many countries the cost of petroleum imports is the largest single import expenditure.

In 2008, a sudden spike in the price of petroleum products caused several Pacific Island countries to declare a fiscal emergency. Fortunately, before there was permanent damage to the countries' economies, the price peaked and then fell to a level that could be managed. But the experience was a clear indication that it was time to reduce the level of petroleum imports through energy efficiency measures and conversion to renewable energy.

As a result, the pace of change in the Pacific Islands relative to energy supply has accelerated dramatically since 2008 with increased emphasis on energy efficiency and in particular the rapid increase in the use of locally available renewable energy resources. In the last five years the rapid addition of megawatts of grid-connected solar and the increasing rate of conversion of small island grids to solar have made it important for developers of energy projects to have access to up-to-date, accurate and appropriate data from both energy suppliers and energy users. Further, it is important that reports of island energy project successes and failures become freely available to help project developers create the most reliable and cost effective projects possible.

With the fast pace of change in the energy situation in the islands and the importance of energy to the economies of the island countries, accuracy and timeliness of data is very important to the proper development of energy projects, particularly renewable energy development that can improve the security of energy supplies and reduce the impact of energy use on national economies.

Currently, regional data collection efforts are largely dependent on country statistics offices and data collected by energy offices. Most of the island country statistics offices have resources limited to providing only the bare essential services needed for the national census and other national survey efforts and do not include the collection and distribution of energy data as part of their services. Energy offices also typically have quite limited resources for data collection and its publishing. Thus those activities tend to be of low priority with sometimes several years passing between data provision and the publishing of that data. While the existing approach to energy data collection and distribution may be adequate to provide a historical perspective, the delays between the accumulation of the data and the publishing of that data are often too long to best meet the needs of project developers. Additionally, it is known that during the process of passing data through several stages, transfer errors can accumulate making it preferable to have access to data provided by the original sources.

While it is possible for project developers to directly contact primary data sources, such as utilities and petroleum importers, that process is tedious and takes considerable time. For example, in the preparation of the 2012 IRENA Pacific Island Country reports, data available from regional agencies was two to three years out of date and not generally acceptable so nearly 1,000 emails were sent and received over many months to the various primary data sources in each country just to obtain and verify up-to-date energy data.

Often, to the frustration of data users, requests for data by individual users are not fulfilled by the data source. Sometimes that is simply because such requests are frequent, annoying and of low priority since few, if any, benefits are seen by the source organisation after making the effort to provide the data. Also it may be that the timing of the request does not fit the timing of the data provision and by the time the data is available, the request has been forgotten. The repository concept promises to avoid these sorts of problems through the creation of formal agreements between the primary data sources and the repository that assure the provision of data to the repository in a timely and accurate manner. In turn the repository will be able to provide users the most up-to-date data with no delay. Discussions with all the officials of the primary energy data sources of Kiribati, Tuvalu and Vanuatu indicated that such an approach was acceptable and much preferable to having data users each request data individually.

Therefore it is proposed that the PRDR be established with the mandate to collect energy related data directly from primary sources as frequently as the data becomes available. For energy imports and usage data that can be as often as monthly. For data from surveys and projects, that also would be provided by the primary sources but timed to fit the actual availability of data.

3. Objectives

The primary objective of the proposed PRDR is to support Pacific governments and their development partners working in the energy sector by facilitating access to up-to-date, reliable energy data and project information.

A secondary objective will be for the repository to make it easy for countries and their donor partners to access reports and documents relating to existing and proposed energy projects in order to help in the replication of successful activities and to avoid repeating mistakes that have been made in past projects.

Once the repository has been well established and functioning well, other objectives of the PRDR that have been proposed could also be to:

- Support standardization of data formats for energy data. This will allow data users to compare data from different countries and better allow consolidation of data for projects that include several countries.
- Support capacity building for data collection and data management in the countries.
- Act as a central repository for renewable energy resource data from past measurements as well as those currently being carried out.

4. Energy data requirements

Based on feedback from meetings and the experience of energy officials and system designers, a detailed list of data considered as a priority for initial input to the repository has been developed and that is attached as Annex I. As the concept is further developed specific data types may be modified but there is general consensus that the general data types shown are very important for the development of energy projects including those intended to increase the efficiency of energy use.

Though ultimately all energy related data may be gathered by the PRDR, initially it is proposed that the repository initially concentrate *only* on the data that stakeholder feedback has established as most important for energy development. The primary sources of those data include:

- *Customs offices* – energy related import data
- *Utilities* – electricity generation data with generation broken down by generation source, energy input type, and energy technology
- *Utilities and regulators* – electricity end use by sector – residential, industrial, government, commercial, etc.
- *Fuel importers* – amounts of each fuel type that is imported overall, amount bunkered, and amount sent to each island in the country
- *Fuel distributors and retailers* – sale of fuels for electricity generation, sea transport, land transport, residential use, industrial use, etc. by island
- *Operators of renewable energy sources (utilities, telecoms, water systems, private sector, etc.)* – energy production by solar, wind, hydro, biofuel, biomass, etc. by island.
- *National Statistics Offices* – census compilations, HIES survey results, residential energy survey results, etc.
- *Ministry of Finance/Reserve Banks* – GDP, import/export data by product category.

Additionally, participating countries and their energy project developers would be requested to provide project documents, design documents, and post installation performance reports to the repository so that other countries could share the concepts and better understand the problems and benefits of similar projects.

5. Strategy and implementation arrangements

The strategy and implementation arrangements proposed below have evolved over time through regional meetings and in-country consultations. Potential barriers and risks to the effective implementation of the PRDR have been identified through this process and these are summarised in Annex II. The following overall principles for implementation were proposed at the Experts Meeting in Suva and through consultation with governments:

- *The PRDR must focus on raw/primary data with no attempt to provide analysis, verification or comment.* Simplicity is the key to speed and the requirement is to make accurate data available as quickly as possible after the data is provided by primary sources. Once the data has been obtained, the users can proceed with their own analysis as needed. Adding a layer of analysis, pruning, explanation or elaboration will not only add time but may result in reduced utility of the data for some users. The primary reason for establishing the repository is to make it possible for users of energy data to access all the needed primary data quickly from one repository instead of having to make the often frustrating and time consuming effort of locating the primary sources of the needed data within each country, determining who to contact at the source and then attempting to obtain the data from those contacts through email.
- *The Repository should get data directly from the primary source (pending agreement with the country on exact modality) immediately following data provision by the primary source.* Timeliness of data availability from the repository is a prime requirement. It is envisioned that data should be provided by the source as soon as it is available for release and the data should be on-line and available for access from the repository within less than a week of its provision by the source.
- *The Repository must be easily accessed and the data must be reliable, timely and accurate so it will become a trusted source.* By providing data on-line that is in no way modified from that provided by the source, there can be little concern about data quality being reduced by its collection by the repository. At the same time, the repository will be able to identify possible problems with submitted data (e.g. seemingly incorrect units, gross changes from other submissions, etc.) that look like they may be errors and can request the source to confirm the accuracy of the data. In this way, the repository can actually improve the quality of the data made available to repository users over data directly obtained from the source.
- *The approach must work with existing structures and should not duplicate any existing efforts of regional or national level entities.* The annual work plan should be vetted by the regional entities and national governments to prevent duplication of effort.
- *The Repository should be independent of governments and institutional constraints other than those under law.* Without autonomy and genuine independence for its operations, it is unlikely that the repository will continue to be fully trusted as it will be assumed to be in some way working behind the scenes to benefit the government or institution on which it is dependent in a way that may lower the quality of its services.
- *The Repository must be dedicated solely to the data collection and distribution effort.* If other requirements are added to its mandate, the speed and accuracy of the data provision is highly likely to decrease due to work conflicts.

- *In the future, the PRDR could include a training function to develop national capacity for data collection and provision.* Feedback from stakeholders in smaller countries indicate that some needed data is not yet available (e.g. fuel type and engine size of registered vehicles) and it is reasonable for the repository to work with the country to develop the means to obtain the needed data and to deliver it to the repository.
- *Must be financially sustainable.* To assure independence it is not appropriate that the repository be financed by its 'host' organisation. Therefore it will be necessary to locate an initial source of funding for the trial period. Once the concept is found to work well and to significantly improve the ability of development partners and countries to access needed data in a timely fashion, longer term funding should not be difficult to arrange.
- *A data 'supply chain' is required that is based on mutual trust and positive relationships between the data providers and the PRDR.* Provision of data by the primary sources must be seen as a benefit to the sources as well as to the country as a whole. By providing the data to the repository the number of requests for data from users should be much less and the requests that remain can simply be directed to the repository for access to the data. Also the repository will be able to help the data sources better organise their data and improve their collection and data storage system.
- *The Repository must serve the signatory countries well and must demonstrate its value if other countries and other stakeholders are to agree to participate.* Currently eleven countries have backed the concept at a high level of government. If during the trial period, the repository proves its utility and value, then it is likely the other countries will join the effort. It is critical that the first few years are focused on provision of priority data and on providing rapid access to data and on providing ease of access to data that is of the highest quality possible.

5.1. Implementation approach

The basic strategies to make the PRDR work well are to keep it simple and keep it independent.

5.1.1 Simplicity

The tasks addressed for the trial period should be strictly limited to obtaining data from the primary sources as soon as the data is available and putting that data on line so it can be accessed. After the trial period, if the PRDR is working well and fulfilling its basic mandate, associated tasks can be undertaken such as capacity building, data format standardization and other activities that can improve the quality of its services.

5.1.2 Independence

Though it makes sense to include the PRDR within a larger entity as that can more efficiently arrange for office space, communications and other services, the provision of basic resources – particularly human and financial – should not be in

any way dependent on the host entity nor should there be any supervision or management of the PRDR by the host entity.

It is proposed that the PRDR and its host arrangements be reviewed by the countries at the end of a trial period and if the countries determine that the PRDR is fulfilling its mandate and providing a worthwhile service, a long term arrangement for its funding and hosting should be established. This trial approach is expected to help minimise the effects of the barriers and risks since the facility is not initially to be considered a permanent entity and is expected to be reviewed and possibly realigned or even cancelled at the end of the trial period.

5.1.3 Phased approach

A two-step approach to implementation of the PRDR has been proposed. The decision on the long-term home of the PRDR can be decided after a trial period of at least three and no more than five years, pending demonstration of the value of the PRDR to governments and development partners. If value is demonstrated within this 3-5 year timeframe, longer term institutional arrangements can be established.

This two-step approach is proposed because the data repository concept has not been tried before in the Pacific and there are reasonable concerns regarding the expectation that the PRDR provides clear benefits and does not in fact just increase the level of bureaucracy at the regional level. Also the trial period is proposed in order to test the host's support and its willingness to allow full independence for the PRDR. At the end of the trial period, the countries supporting the PRDR concept will be expected to review the facility and determine if (a) the PRDR should be continued, and (b) if continued, should the existing hosting arrangements also be continued, changed or should the PRDR be made into an autonomous regional agency.

5.2. Institutional setting

To minimise the overhead costs, it appears logical for the PRDR to be hosted by a regional or national entity in the Pacific. Establishing the PRDR as a new regional entity, at least during the trial period would not offer significant advantages so long as the host institution allows the PRDR sufficient autonomy to carry out its mandate without diversion of its resources to other activities of the host body. Locating the Repository within an existing organisation, whether regional or national, as an autonomous unit with its own dedicated funding and resources appears to be the most efficient approach, particularly for the trial phase of operations as proposed. The host organisation would need to be able to provide shared administrative services and shared physical resources while actual operation of the PRDR would need to be fully autonomous and not dependent on the host for financial support. In January 2014 ESCAP sought expression of potential interest for hosting the PRDR and received positive responses from SPC, USP and Palau.

5.2.1. Criteria for hosting

The primary criteria for hosting that are required are:

1. Total autonomy for the PRDR including for financial transactions, tendering and auditing. No one in the PRDR is required to report to any superior officer in the host institution and no operational regulations of the host, other than those related to security, safety and office cleaning will be enforced for the PRDR.
2. Provision of sufficient office space and access to associated spaces (toilets, break rooms, parking for staff, etc.) sufficient for the PRDR to function efficiently.
3. The site must be able to access the Internet reliably and with sufficient bandwidth to allow access to the website reliably and adequately.

Secondary criteria that can be expected to be beneficial to the PRDR but are not required:

- Internet bandwidth consistently sufficient for low cost Skype or other VOIP type of communications with client countries.
- Access to good housing and moderate to low cost of living for staff from other countries.
- Availability in the country of the technical services and materials needed to properly maintain staff computers and associated technical equipment.
- Provision of janitorial services, electricity, Internet, and/or other services as part of the hosting package.

6. Operational requirements

The following minimum ongoing resources would be required for the basic functioning of the PRDR:

- *Human resources* – five staff including a general manager, an office administrator/financial manager, two data collection and data entry staff, and an IT professional to manage the local computer systems and a website to provide for external access to data.
- *Office space and equipment* – sufficient for the staffing level
- *IT infrastructure* – sufficient to provide external entities easy access to data through the Internet
- *Travel budget* – to perform country visits as required
- *Administrative budget* – office supplies, external support (audits, etc.)
- *IT Budget* – website and computer systems maintenance budget

It is suggested that the initial staffing of the PRDR be small. As noted above, five persons is proposed as the start-up staffing:

- *Manager* – works with countries at a high level to help maintain prompt data provision, establish and maintain MOUs or other arrangements between the PRDR and data providers, engage staff and external experts as needed, and ensure that the mandated services are provided.
- *Data collectors* – two persons working constantly with data providers in the countries. They will implement the MOUs between the data providers and the PRDR ensuring that data is indeed provided as required and in the agreed

upon format (typically Excel files). They will check data for obvious errors and will query the data supplier for confirmation if errors are suspected. The data collectors will travel to countries as required to establish arrangements with new data sources and to work out serious problems with existing sources that arise over time. They also enter the collected data into the website database with appropriate checks for errors. In most cases it is hoped that the data files received from the countries can be directly uploaded to the database after checking, but in some cases manual copying of data will be needed.

- Data management, website maintenance and IT person – establishes and maintains the computerised database that is delivered on-line. Supports the data collectors in their delivery of data to the website database.
- Administrator – financial management including bookkeeping, bank reconciliation, payroll, etc. Interface with the host regarding the support being provided.

5.3. Monitoring and evaluation

It is proposed that the PRDR would report to the Energy Ministers Meeting every two years with guidance from the Senior Officials. Regular updates would also be provided to the Pacific Energy Advisory Group (PEAG). A mid-term review of the PRDR is proposed, drawing on the existing evaluation capacity of partner organisations rather than requiring external financial resources. A final external evaluation of the PRDR is proposed beginning at the start of the final year of the trial period to determine whether the PRDR should continue to operate.

6. Estimated budget requirements

It is estimated that an operational budget of a minimum of USD 1,252,236 would be required for the first 5 year phase of operation. This estimate assumes the provision of office space and other facilities by the host organisation. A more detailed estimated budget is provided in Annex III.

A stakeholder's meeting was held at the ESCAP offices in Suva on 5-6 December, 2013. As part of that meeting, participants were asked to prioritise the types of data that should be collected by the Repository. There were four classes of data that were considered of primary importance: (1) utility data; (2) petroleum data; (3) renewable energy project data; (4) economic data. It is recognised that not all of these data items can be expected to be immediately available from all countries but it should be part of the long-term function of the repository to help countries access and provide the data as soon as practical.

Class 1: Utility Data (from utilities for each grid in the country)

- kWh generated per month
- Fuel used for generation per month
- kWh delivered (by sector) per month
- Tariff structure
- Streetlights in service
- Number of customers (by sector and island)

Class 2: Petroleum and Transport Data (from customs and petroleum companies)

- Imports (by fuel type)
- Bunkered Fuel
- Fuel deliveries (by island and fuel type)
- Fuel used for land transport (by island)
- Fuel used for local shipping
- Fuel used for local air transport
- Kerosene delivered to each island
- Outboard motor oil imported and/or sold (by island)
- Characteristics of vehicles that have been imported (type of vehicle, engine size, year of manufacturer, status as to new or used)

Class 3: Renewable Energy Project Data (from project developers and energy offices)

- Solar Home Systems installed and basic characteristics (by island)
- Solar mini-grids installed and characteristics (by island)
- kWh delivered by each mini-grid (per installation)
- Wind energy installations and characteristics (by island)
- kWh delivered by wind power systems (by island)
- Hydro energy installations and characteristics (by island)
- Hydro energy kWh production (by island)
- Other renewable energy installations (by island)
- Energy delivered by other renewable energy installations
- Production of copra and coconut oil (by copra/oil producing island)
- Renewable energy resource data (by location)

Class 4: Economic and Demographic Data (Ministry of Finance or comparable agency and national statistics offices)

- GDP
- Import-Export statistics by commodity
- HIES survey results
- Census results
- Other energy or economic survey results (e.g. household energy survey)

In addition to these priority statistics, reports relating to energy projects and energy related activities are proposed to be collected and made available for general use.

Annex II

Barriers and risks to implementation

The following barriers to implementation have been identified, and measures have been proposed to address these potential barriers as summarised in the table below.

Barrier	Response
Lack of awareness of the commitments by national leaders – the PRDR should be discussed at the cabinet level and with all relevant ministries.	Preparation and circulation of a cabinet submission template on the PRDR
Duplication of work being undertaken, particularly by SPC, IRENA, PPA and SPREP.	Provide SPC, IRENA, PPA and SPREP copies of the draft proposal for identification of any duplication of effort.
National legislation may act as a barrier to data sharing.	Undertake national consultations to determine availability of primary data and determine what data is subject to restrictions under national legislation (e.g. raw survey data that identifies the respondents).
Confidentiality of data (especially private sector).	Consult the private sector widely in the preparations for the PRDR and establish clear incentives for private sector participation.
Limited capacity of National Statistical Systems and data providers.	The proposed approach is to obtain data directly from primary sources and to support National Statistics Offices requirements for such data by providing the primary/raw data to the NSO as needed. This will assist the country NSOs since all energy data will be available directly from the PRDR
Inadequate national data	Work directly with data providers and seek opportunities to strengthen data collection over time.
Difficult to get data from outer islands	Over the long term the PRDR can work with national governments to improve data collection and communications from outer islands.
Data from primary sources will not be in a standard format	As experience is gained the PRDR can work with data sources to improve standardization of formats

Risks to implementation and measures to address these are summarised below.

Risk	Response
Sustainable financing for the entity over time	Obtain sufficient funding for the trial period. Provided the repository is found to provide a needed service during its trial period, countries will need to lobby donors for continued funding.
Commitment from participating countries must be sustained over time.	Start slowly and do a very good job in gathering and making available basic energy data (e.g. petroleum, utility and renewable energy resource data) with emphasis on speed and making available high quality, high priority data rather than broadness of the data base.
Commitment from donors, including the sharing of studies, reports, evaluations etc.	Obtain country support and cooperation to request donors to incorporate such sharing as a part of project implementation agreements.
Information collection and distribution may need to be mandated and empowering legislation may be necessary under some circumstances	As needs arise for such data, the PRDR would work with governments to establish the needed mandates and legislation necessary to collect and distribute data important to national energy development

Annex II**Indicative Budget (USD)**

Item	Year 1	Years 2-5	Total
Personal*	170,500	682106	852,606
Consultancies**	10,000	10,000	50,000
Travel	30,000	30,000	150,000
IT infrastructure	20,000	5,000	40,000
Meetings	20,000	20,000	100,000
Administration (5%)	12,525	37,355	59,630
Total	263,025	784,461	1,252,236

*UN Salary Scales for National Professional Staff and General Service Staff for Fiji have been used as a guide (1xNO-D, 2xNO-A, 2xGS6).

** For continued review, monitoring and evaluation