

## PROJECT IDEA NOTE (PIN)

**Name of Programme:** PoA for Supply Side Energy Efficiency Improvement on Solomon Islands Electricity Authority (SIEA) power stations

**Date submitted:** 27 June, 2012

### **Description of size and quality expected of a PIN**

Basically a PIN will consist of approximately 5-10 pages providing indicative information on:

- the type and size of the program
- its location
- the anticipated total amount of GHG reduction compared to the “business-as-usual” scenario (which will be elaborated in the baseline later on at PoA DD and CPA DD level)
- Duration of the program and crediting period of the CPAs under the Program
- the estimated CER price in US\$/ton CO<sub>2</sub>e reduced
- the financial structuring (indicating which parties are expected to provide the project’s financing)
- the project’s other socio-economic and environmental effects/benefits

**While every effort should be made to provide as complete and extensive information as possible, it is recognised that full information on every item listed in the template will not be available at all times for every project.**

## A. Program Description, Type, Boundary and Schedule

<p><b>Objective of the Program</b> (Describe the policy/measure or stated goal that the PoA seeks to promote)</p>	<p>In Solomon Islands, electricity is generated and supplied by the Solomon Islands Electricity Authority (SIEA), which is a state-owned electricity utility that has the sole mandate to provide power across the country.</p> <p>The objective of the Programme of Activity (PoA) is to implement energy efficiency measures in all SIEA power stations which will reduce fuel consumption in the diesel generators used for power generation.</p>												
<p><b>Program Description and Proposed Activities</b> (About ½ page)</p>	<p>The country currently faces considerable challenges in the development of the energy sector, including maintaining reliability of energy supply, ensuring commercial viability of the public utility SIEA, increasing access and improving energy security by reducing dependence on imported fossil fuel.</p> <p>In 2010, the Government of Japan organized training for Solomon Islands and other Pacific Island countries on how to operate their diesel-generators efficiently. The training was held in Okinawa and Solomon Islands sent 2 participants from SIEA and Ministry of Mines, Energy &amp; Rural Electrification. There was a follow up Workshop held in December 2011 in Suva, Fiji. The training was conducted by Okinawa Enetech Company's Research &amp; Development Department.</p> <p>The method to be applied was taught to participants of the Pacific Island Countries (PICs) and is called the EDC assist system – <b>Economic Load Dispatching Control (EDC)</b>. EDC method is used to support the control of multiple diesel power generating sets operating in parallel by minimizing fuel consumption all the time for load demand. The combination of units to be operated together is optimized through calculating their measured fuel efficiencies. The EDC method is meant to be simple and cost-effective because it utilizes the existing monitoring devices installed in the generation fuel flow system. The different load demand combination tables created are used to control each generator load at the different load demand. Training of personnel on how to use EDC method is the major cost. However, poor maintenance over the years means that fuel flow system need to be consolidated and updated.</p> <p>The exact implementation schedule is not yet finalized but tentative timelines for proposed activities are as below:</p> <table border="1" data-bbox="683 1675 1362 2009"> <thead> <tr> <th data-bbox="689 1684 746 1765">N o.</th> <th data-bbox="753 1684 1034 1765">Activity</th> <th data-bbox="1040 1684 1203 1765">Duration of Activity</th> <th data-bbox="1209 1684 1356 1765">Funding Source</th> </tr> </thead> <tbody> <tr> <td data-bbox="689 1774 746 1890">1</td> <td data-bbox="753 1774 1034 1890">Training of Personnel (includes Honiara &amp; the 9 outstations operational staff)</td> <td data-bbox="1040 1774 1203 1890">2 weeks</td> <td data-bbox="1209 1774 1356 1890">SIEA</td> </tr> <tr> <td data-bbox="689 1899 746 2009">2</td> <td data-bbox="753 1899 1034 2009">Measuring equipment and devices (flow meters, stop watches &amp;</td> <td data-bbox="1040 1899 1203 2009">NA</td> <td data-bbox="1209 1899 1356 2009">SIEA</td> </tr> </tbody> </table>	N o.	Activity	Duration of Activity	Funding Source	1	Training of Personnel (includes Honiara & the 9 outstations operational staff)	2 weeks	SIEA	2	Measuring equipment and devices (flow meters, stop watches &	NA	SIEA
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		accessories)		
	3	Computer & printer costs	NA	SIEA
	4	Trial runs – usually about 3 months. Normally a comparison is done before and after the gen sets is overhauled	12 weeks	SIEA
	5	Evaluation costs	1 week	SIEA
		The implementation of the proposed project will achieve CO <sub>2</sub> emission reductions by reducing diesel consumption in SIEA generating sets		
<b>Technology to be Employed</b> <i>(Describe in not more than 5 lines)</i>		EDC method has the EDC software that does the calculation of the load allocations for the least fuel consumption in operating multiple diesel generating sets. This software is developed with Visual Basic for Applications (VBA) of MS-Excel particularly useful for the formulation of the EDC table.		
<b>Type of Program</b>				
Greenhouse gases targeted CO <sub>2</sub> /CH <sub>4</sub> /N <sub>2</sub> O/HFCs/PFCs/SF <sub>6</sub> <i>(mention what is applicable)</i>		CO <sub>2</sub>		
<b>Boundary of the Program</b>				
The boundary for the PoA in terms of a geographical area		Pan Solomon Islands		
<b>Duration of the Program</b>				
Starting Date		2013		
Duration/Length		28 years		
<b>Program Coordinating/managing Entity</b>				
Name of the Coordinating Entity		Solomon Islands Electricity Authority under Ministry of Energy, Mines and Rural Electrification		
Confirm that the program is a voluntary action by the coordinating/managing entity		Yes program is a voluntary action by SIA and is not required by law in the host country.		
Organizational category (private entity or public entity)		Government Organization		
Summary of the relevant experience and capability of the Coordinating Entity <i>(Describe in not more than 5 lines)</i>		The business of SIEA is generation, transmission, distribution and sale of electricity throughout the Solomon Islands whilst providing reliable and cost-effective electricity in the Solomon Islands. Located in the capital Honiara, SIEA has branches throughout Solomon Islands; Auki, Gizo, Noro, Munda, Buala, Tulagi, Malu'u, Kirakira and Lata.		
<b>Operational /management arrangements</b>				
Operational and management arrangements between the coordinating entity and the participating organisations		The PoA is a voluntary action being coordinated and managed by SIEA, the coordinating entity. SIEA will be investing, operating and managing the proposed PoA and CPAs included under this PoA.		
<b>Expected Schedule</b>				
Earliest Program starting date <i>Month/Year in which PoA will be operational</i>		2013		
Expected first year of CER		2014		

delivery	
Lifetime of the CPAs <i>Number of years</i>	30 years
For CPAs: Expected Crediting Period <i>7 years twice renewable or 10 years fixed</i>	7 years twice renewable (crediting period for all CPAs ends after 28 years of PoA registration)

## B. Methodology and Additionality of the Programme of Activities

<p><b>Sector Background</b> Please describe the laws, regulations, policies and strategies of the Host Country that are of central relevance to the proposed project, as well as any other major trends in the relevant sector (e.g. any law/regulation on waste disposal or renewable energy targets)</p>	<p>Due to the reliance on diesel generation, power tariffs in Solomon Islands are high. SIEA charges a national uniform tariff, which in 2010 was US\$ 0.59/kWh to residential customers and US\$ 0.63/kWh to commercial customers. Due to the high cost of transporting diesel to the outstations, generation costs in the outer islands are considerably higher than Honiara. Generation costs in the outer islands are significantly higher than in Honiara (US\$0.53/kWh in Honiara compared to US\$0.94/kWh in Lata<sup>1</sup>). The high cost of power generation in the outer islands has a negative financial impact to SIEA's operations and provides a disincentive to the corporatized SIEA to expand the distribution network. The current electricity tariff does not allow full cost recovery<sup>2</sup> for SIEA. As a result investment in maintenance and expansion of core power infrastructure has been lacking.</p> <p>Nationwide electricity is supplied to approximately 14% of the population<sup>3</sup>. With few exceptions, electrification is confined to Honiara and eight provincial centers. Outside of these urban centers, less than 5% of the rural population has access to electricity through a small number of off grid and individual household solar systems. Access rates in Guadalcanal (Honiara) is 20% and Western Province is 17%, however access rates in the remaining provinces is extremely low, for example Malaita 3%, Temotu 3%, Choiseul 2%.</p> <p>The poor performance of the power industry presents a major constraint to private sector development and economic growth. The proposed program is not required by any regulation in Solomon Islands. The program is not intended to run under a public incentive scheme, nor is it required by law.</p>
<p><b>Description of a typical CPA</b> (activities and measures to be covered, e.g. a MSW site or multiple MSW sites in a city)</p>	<p>A typical CPA under the programme will consist of Energy Efficiency measure implemented in SIEA's power stations..</p>
<p><b>Eligibility criteria for CPAs</b> (Define the eligibility criteria for inclusion of a project activity as a CPA under the PoA, which shall include, as appropriate, criteria for</p>	<p>The eligibility criteria for inclusion of a project as a CPA under the PoA are :</p> <ul style="list-style-type: none"> <li>• The CPA must be located in the boundaries of the host country(ies) of the PoA as defined in this document</li> </ul>

<sup>1</sup> Calculations are based on SIEA's generation records and calculation of operating costs produced by the consultants under ABD/RETA-7329

<sup>2</sup> SIEA Corporate Plan 2010-2015. A tariff study is proposed for 2012 under the World Bank supported Solomon Islands Sustainable Energy Project (SISEP).

<sup>3</sup> Based on population projections, SIEA account data (8 person per household assumptions)

<p>demonstration of additionality of the CPA, and the type and/or extent of information that shall be provided by each CPA in order to ensure its eligibility)</p>	<ul style="list-style-type: none"> <li>• Project activity should reduce fuel consumption in the diesel generators used for power generation in power station.</li> <li>• The technology applied in the CPA must conform to the description as set out in this document</li> <li>• The CPA must comply with all the applicability conditions of Methodology specified in the PoA DD</li> <li>• CPA must meet the conditions of Additionality as specified in Additionality Section below.</li> <li>• The PoA-specific requirements stipulated by the CME including any conditions related to undertaking local stakeholder consultations and environmental impact analysis;</li> <li>• Conditions to provide an affirmation that funding from Annex I parties, if any, does not result in a diversion of official development assistance;</li> <li>• The CPA must meet the requirements for the debundling check for the small-scale (SSC) project category.</li> <li>• Each CPA shall not be registered, or be in the process of registration, as an individual CDM project activity.</li> <li>• Each CPA shall not be included in another registered PoA.</li> </ul>
<p><b>Methodology</b> (to be applied by all the CPAs)</p>	<p>The projects under this programme fall under the scope of following methodology :</p> <p><i>Type II : Energy Efficiency Renewable energy projects</i></p> <p><i>Category: II.B<sup>4</sup> – Supply side energy efficiency improvements – generation Grid connected renewable electricity generation (Version 09,EB 33)</i></p> <p><i>Sectoral Scope :0 1</i></p>
<p><b>Baseline Scenario</b> PoAs must result in GHG emissions being lower than “business-as-usual” in the Host Country. At the PIN stage questions to be answered are at least:</p> <ul style="list-style-type: none"> <li>• Which emissions are being reduced by the proposed PoA?</li> <li>• What would the future look like without the proposed PoA? (About ¼ - ½ page)</li> </ul>	<p>CO<sub>2</sub> is the targeted emission reductions by the project activity.</p> <p>Electricity supply in the Solomon Islands is provided to less than 20 % of the population. Almost all generation is based on imported diesel fuel. Apart from this high dependence on external supply, the country also faces challenges in terms of the development of the energy sector, including maintaining reliability, ensuring commercial viability of the power utility SIEA and increasing access to modern energy supply. A historically poor performance of the power industry also presents a serious constraint to private sector development and economic growth. With few exceptions, electrification is confined to Honiara and the provincial centers. Outside of these centers, only about 5% of the rural population has access to electricity through a small number of off-grid and individual household systems.</p> <p>In the absence of this program the baseline scenario would be continued usage of high diesel quantities for electricity generation with very high operational costs due to high costs of diesel.</p>

<sup>4</sup> <http://cdm.unfccc.int/methodologies/DB/69MEFLV8HH6LBRAFQRAZ3XEF2BYTMG>

<p><b>Additionality</b> Please demonstrate that in the absence of the CDM either: (i) the proposed voluntary measure would not be implemented, or (ii) the mandatory policy/regulation would be systematically not enforced and that non-compliance with those requirements is widespread in the country/region, or (iii) that the PoA will lead to a greater level of enforcement of the existing mandatory policy /regulation. This shall constitute the demonstration of additionality of the PoA as a whole;</p>	<p>Currently there are no regulations or incentive schemes in place covering the project in Solomon Islands.</p> <p>Project additionally can be demonstrated as per “Guidelines for demonstrating additionally of Micro-scale project activities” EB 63 (version 3)”.</p> <p>As per the paragraph 3 of the guidelines:</p> <p>Energy Efficiency project activities that aim to achieve energy savings at a scale of no more than 20 GWh per year are additional if any one of the conditions below is satisfied:</p> <ul style="list-style-type: none"> <li>(a) The geographic location of the project activity is in LDC/SID or special underdeveloped zone of the host country identified by the Government before 28 May 2010;</li> <li>(b) The project activity is an energy efficiency activity with both conditions (i) and (ii) satisfied;</li> <li>(i) Each of the independent subsystems/measures in the project activity achieves an estimated annual energy savings equal to or smaller than 600 megawatt hours; and</li> <li>(ii) End users of the subsystem or measures are households /communities/ SMEs</li> </ul> <p>According to the United Nations, Solomon Islands is classified both as a Least Developed Country (LDC) and Small Island Developing State (SIDS)<sup>5</sup>. Each CPA under the Programme is expected to have energy savings less than 20 GWH and shall be automatically additional as per the above EB guidelines.</p>
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### C. Real Case CPA - Description, Type, Boundary and Schedule

<b>Title of the CPA</b>	Supply Side – Energy Efficiency on Noro Munda power stations.
<b>Description of the CPA</b> <i>(Describe in not more than 5 lines)</i>	The proposed CPA involves installation of Economic Load Dispatching Control (EDC) system at Noro Munda power station. It is estimated that the project activity on an average will lead to diesel savings of the tune of 5,369,877 litres per year over a period of 21 years at Noro Munda Power Station.
<b>Greenhouse gases targeted</b> CO <sub>2</sub> /CH <sub>4</sub> /N <sub>2</sub> O/HFCs/PFCs/SF <sub>6</sub> <i>(mention what is applicable)</i>	CO <sub>2</sub>
<b>Boundary of the CPA</b>	
The boundary for the CPA in terms of a geographical area	Noro Munda Power Station, Choiseul Province, Solomon Islands
<b>Crediting Period of the CPA</b>	
Starting Date	2013
Duration/Length	30 years

<sup>5</sup> <http://www.un.org/special-rep/ohrlls/sid/list.htm>

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<b>Entity/individual responsible for the CPA</b>																			
Name	Solomon Islands Electricity Authority under Ministry of Energy, Mines and Rural Electrification																		
Role of the Entity/individual	Coordinating and Managing Entity																		
Organizational category	Government Organization																		
<b>Eligibility of the CPA</b> (Justify why the CPA is eligible to be covered under the PoA)	<p>The CPA is eligible under the proposed PoA because:</p> <ul style="list-style-type: none"> <li>• The CPA is located in Solomon Islands which is the project boundary of the proposed PoA</li> <li>• Proposed Project activity results in reduction of diesel consumption at Noro Munda power station.</li> <li>• The project uses EDC technology as prescribed for this PoA.</li> <li>• The CPA meets all the applicability conditions of the Methodology AMS II.B version 09.</li> <li>• The CPA meet the eligibility conditions set out in Additionality Section.</li> <li>• The project shall follow the PoA-specific requirements related to local stakeholder consultations and environmental impact analysis;</li> <li>• Project does not involve any funding from Annex I parties or diversion of official development assistance;</li> <li>• The project activity is not a de-bundled component of a large project activity.</li> <li>• The project activity is not registered, or in the process of registration, as an individual CDM project activity.</li> <li>• Proposed CPA is not part of any registered PoA</li> </ul>																		
<b>Baseline &amp; Additionality</b> Please demonstrate that in the absence of the CDM, the proposed CPA will not be implemented.	<p>In the absence of this CPA the baseline scenario would be continued usage of high diesel quantities for electricity generation.</p> <p>The proposed CPA meets the eligibility criteria of additonality as proposed project activity is in Solomon Islands which is classified as both LDC and SID by United Nations. The estimated energy efficient from the project are less than 20 GWH per year.</p>																		
<b>Expected Schedule</b>																			
Earliest CPA starting date <i>Month/Year in which the plant/project activity will be operational</i>	2013																		
<b>Estimate of GHG Abated/ CO<sub>2</sub> Sequestered</b> <i>In metric tons of CO<sub>2</sub>-equivalent, please attach calculations</i>	<p>Annual (if varies annually, provide schedule):</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Year</th> <th>Emission Reduction (tCO<sub>2e</sub>)</th> </tr> </thead> <tbody> <tr> <td>2014</td> <td>8,572</td> </tr> <tr> <td>2015</td> <td>8,929</td> </tr> <tr> <td>2016</td> <td>9,301</td> </tr> <tr> <td>2017</td> <td>8,572</td> </tr> <tr> <td>2018</td> <td>8,929</td> </tr> <tr> <td>2019</td> <td>9,301</td> </tr> <tr> <td>2020</td> <td>9,689</td> </tr> <tr> <td>Total</td> <td>63,297</td> </tr> </tbody> </table>	Year	Emission Reduction (tCO <sub>2e</sub> )	2014	8,572	2015	8,929	2016	9,301	2017	8,572	2018	8,929	2019	9,301	2020	9,689	Total	63,297
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	Up to and including 2012: NA tCO <sub>2</sub> -equivalent Up to a period of 10 years: NA tCO <sub>2</sub> -equivalent Up to a period of 7 years: 63,927 tCO <sub>2</sub> -equivalent
<b>No double-counting</b> Confirm that the CPA is neither included in any other PoA nor registered as a CDM project	At present there is no PoA registered in Solomon Islands. Hence the CPA will not involve double-counting of emission reductions.

## D. Finance

### D1. Finance at PoA Level

<b>Total Cost Estimate</b>	
Subsidies/incentives to the CPAs (if any)	N/A US\$ million (Feasibility studies, resource studies, etc.)
Capital Investment	130,000 US\$ million (Property plant, equipment, etc.)
<b>Sources of Finance to Be Sought or Already Identified</b>	
<b>Public Funding and ODA</b> (In case public funding is used a confirmation that official development assistance is not being diverted to the implementation of the PoA)	No ODA is involved in this PoA

### D2. Finance of the Real Case CPA

<b>Total Estimated Costs : Please note detailed break up at each CPA level is currently under planning stage</b>	
Carbon finance (confirmed or estimated CER sales revenue, price per CER)	USD 8 -10 (Indicative Price range only)
Public fund (indicate whether public fund is used for the CPA or not. If yes, confirm whether any Official Development Assistance has been diverted for the implementation of this CPA)	No ODA will be involved in the proposed CPA

## E. Expected Environmental and Social Benefits (In Programmes of Activities CDM, Environmental Analysis can be conducted at PoA level or CPA level, subject to decision by the Coordinating/managing entity and the national regulations)

The price of electricity in Solomon Islands remains one of the highest in the Pacific region at around US\$ 0.50/kWh. The Solomon Islands Electricity Authority (SIEA) faces numerous challenges in providing reliable, sustained electricity at a reasonable cost, including rising oil prices, accumulated arrears, and unevenly maintained generation and network infrastructure leading to frequent power cuts across towns served by the SIEA. Access to reasonably priced, reliable energy is a vital element of growth and, as such, this must be addressed. The diesel-fired generators that supply nearly all of the country's electricity are a major contributor of fossil fuel imports, accounting for around 30 percent of Solomon Islands' total imports--affecting the nation's balance of payments situation.

The proposed PoA reduces nation's reliance on imported fuel and it is a major concern of the Government of Solomon Islands to reduce imports on petroleum fuel to restrain the pressure

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on foreign reserves.

As per the Environment Act (1998) the project does not fall under the preview of  
environmental impact assessments (EIAs).