





## Technology data sheet : Operation of Hybrid Village Grid

<b>Type of project:</b> (tick off the type)	PV	Solar Thermal	Biomass to Energy	
	✓			
<b>Project name:</b>	<b>Operation of Hybrid Village Grid by Private Energy Provider (PEP) as a solution for LDC countries</b>			
<b>Location of the plant:</b>	<b>Lao PDR</b> Namka village, Phaxay district, Xiengkhouang province, Lao PDR			
<b>Year of Implementation:</b>	April 2007			
<b>Operator:</b> (Name and address)	Village committee and technicians, Namka village, Phaxay district, Xiengkhouang province, Lao PDR			
<b>Planner:</b> (Name and address)	Sunlabob Co. Watnak. Lao-Thai friendship road. Vientiane Lao PDR Tel.: +856-21 313874			
<b>Detailed description of the installation:</b> (technology, function, benefit for users, etc. max 150 words)	Public-Private partnership for Hydro-PV-biodiesel or diesel genset with mini-grid. Such approach is more suitable for productive use of electricity, and hence, it provides better for income generating activities and makes energy service more reliable and sustainable. Village (Public) assets: dams, intake, channel, machine housing, village grid, etc (depending on each concrete situation) (see diagram attached below) Company (private) assets: Equipment, machines, PV systems, penstock, turbine, generator, solar generators chargers, inverters batteries, etc (depending on installed system's components) Energy service provider manages the system through village electricity committee and village technicians, and sells 220V AC electricity.			
<b>Generated Energy service:</b> (tick off the energy type)	Electricity	heat	gas	Light
	✓ (220V AC)			
<b>Power output of installation:</b> (kWel, m <sup>3</sup> biogas, kW th, etc.)	<ul style="list-style-type: none"> <li>Hydropower: 15 kWe</li> <li>PV: 1.84 kWp</li> <li>Gen-set: 15 kWe (currently works on diesel, but planned for bio-diesel, which will be produced locally)</li> </ul> <p>currently about 40 households already connected to the village grid with ~1,3 kWh/ household/day), totally domestic use ~ 1500 kWh/month; for productive use ~ 3700 kWh/year (load profile estimation</p>			
<b>Financing</b> (tick off the financing type)	Private investment	loan	donation	Grant
	✓ (public-private)			
<b>Investment costs in US\$</b>	<ul style="list-style-type: none"> <li>Public asset costs: 30,000 US\$</li> <li>"Soft" investments in the form of trainings and coaching for company engineers, local technician and entrepreneurs, plus the demonstration and media efforts: 30,000 US\$</li> <li>Movable private assets: 90,000 US\$</li> <li>Total investment: 150,000 US\$</li> </ul> <p><b>[www.sunlabob.com]</b></p>			

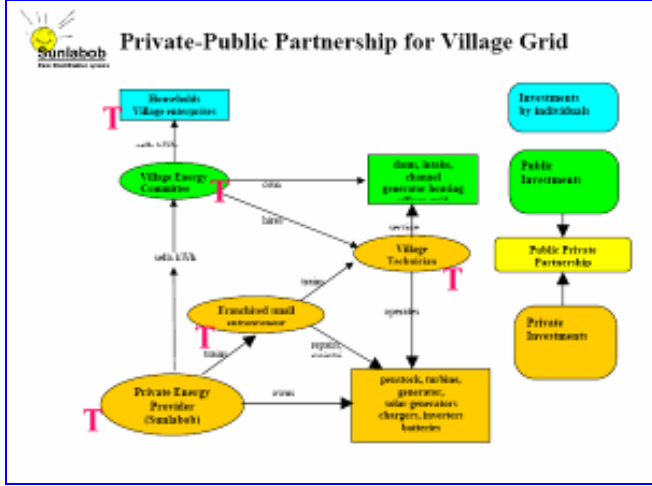
<b>Maintenance costs in US\$</b>	800 US\$/year [ <a href="http://www.sunlabob.com">www.sunlabob.com</a> ]		
<b>Savings:</b>	<p>Expected savings</p> <ul style="list-style-type: none"> <li>• Battery charges. Two ways to charge the battery: <b>(1)</b> in nearby electrified areas, via daily commuted shuttle pick-up (the nearest is about 35 km far away from the village); <b>(2)</b> from small gen-set –charger right in the village, but limited capacity and more expensive due to expensive fuel). About 50% of villagers owning batteries</li> <li>• Diesel fuel for engine gen-set to run rice huller, batteries charger, lighting, entertainment devices (several houses own such systems)</li> <li>• Kerosene, candle, dry-cells torch batteries for lighting</li> <li>• in the future: Saving wood fuel for water heating and cooking, at least rice cooking (from survey, many households have expressed their willingness to purchase electric rice cooker if there was suitable electricity)</li> <li>• Automotive battery charging costs: ~0,8\$/charge (including travel 0,3\$ and charging fee 0,5\$)</li> <li>• Local Kerosene price~9500LAK/L or ~1 \$/L</li> <li>• Wood fuels from surrounding village forest are free of charges</li> </ul>		
<b>Energy sale income in US\$:</b>	Estimated 8,000 US\$ annual income (to be verified by this pilot phase) [ <a href="http://www.sunlabob.com">www.sunlabob.com</a> ], ~0,2 UScent/kWh x (domestic 42000kWh+public 6650kWh+productive 44400kWh) x 40% the first year connection ~ 7831,58 US\$		
<b>Comments:</b>	This is a pilot system and it has just been commissioned recently. Many management and operational processes are being set up.		
<b>Pictures and grafics</b>			
			
Micro Hydro unit	Forbay Reconstruction	PV system unit	Control box



Diesel gen-set unit



Distribution lines



Concept of Private –public Partnership for village grid  
(courtesy by Sunlabob Co. [www.sunlabob.com])