

Country report

Update for period since last IANAS energy workshop, April 2012

Present situation and perspectives of renewable energy use in Peru

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Information on the use of renewable energy in Peru was presented at the previous IANAS energy workshops and is published on the IANAS website.
In the following are presented some new activities and forecasts.

IANAS project priority area:
Meeting the energy needs of
the poorest people



IANAS Energy project Agenda
La Paz, Bolivia
April 17 -19, 2012

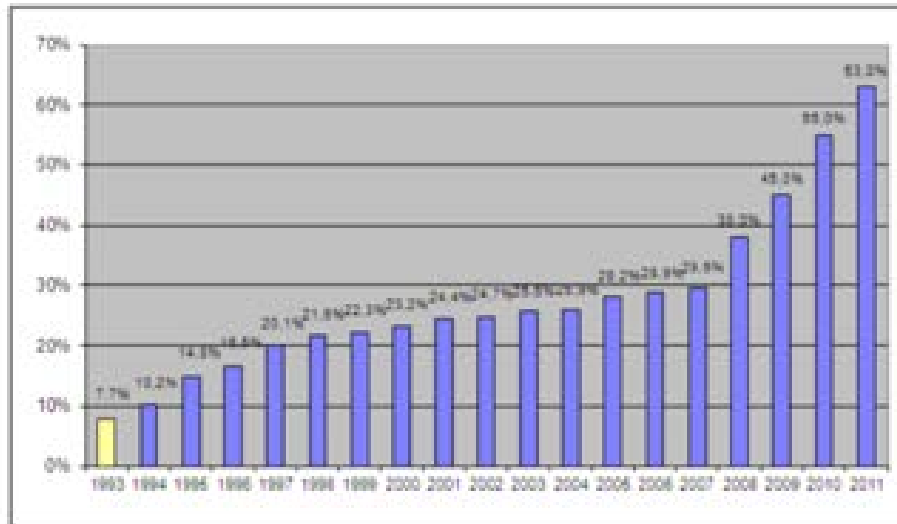
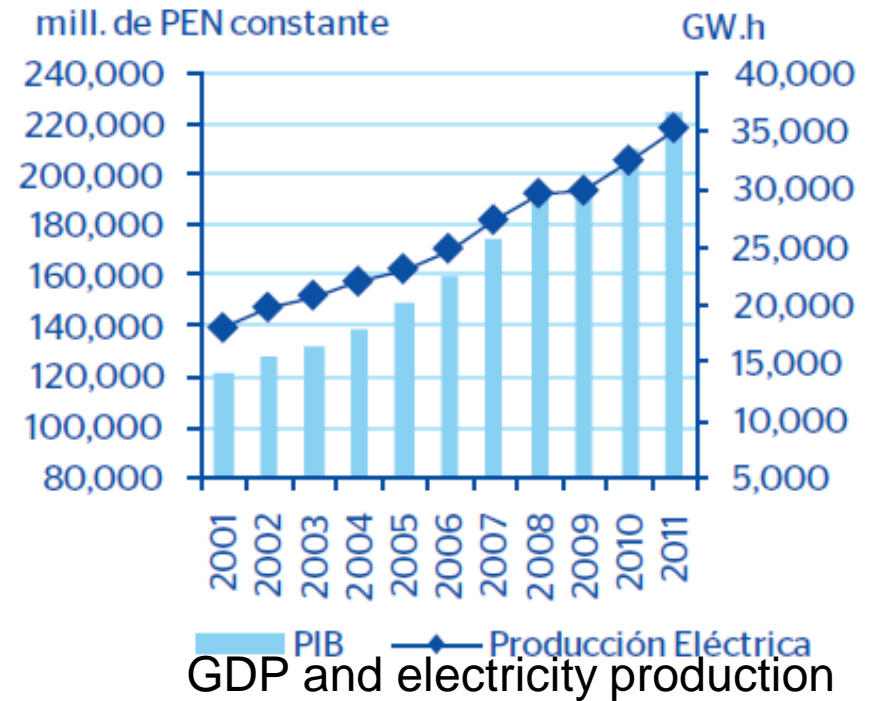
An aerial photograph of a rural village in the Andes. The village is built on a valley floor, surrounded by rolling hills and mountains in the background. The houses are clustered together, and there are some larger buildings, possibly schools or government offices. The landscape is a mix of green fields and brownish soil.

SOLAR ENERGY FOR THE DEVELOPMENT OF REMOTE ANDEAN RURAL AREAS

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Electrification of Peru

Installed capacity (2012): 7,62 GW
 projected (2016): 10.5 GW
 52 % fossil (mainly natural gas),
 48% renewable (mainly hydro;
 0.6% biomass, **0.4% solar**)
 5-7 % growth/year



600 MW Thermal powerplant (natural gas)

Source: COES, MINEM, BBVA

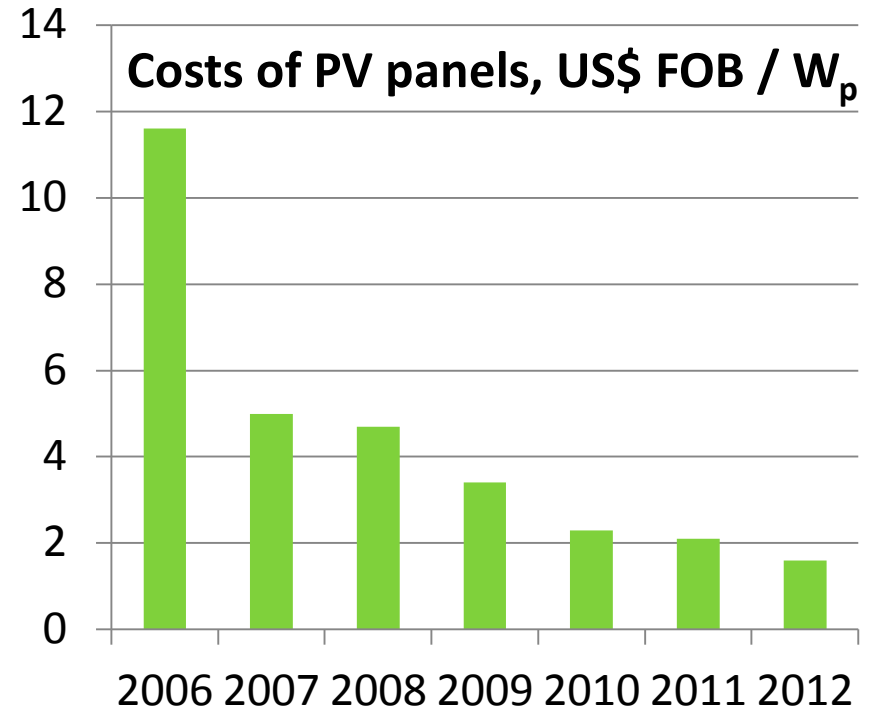
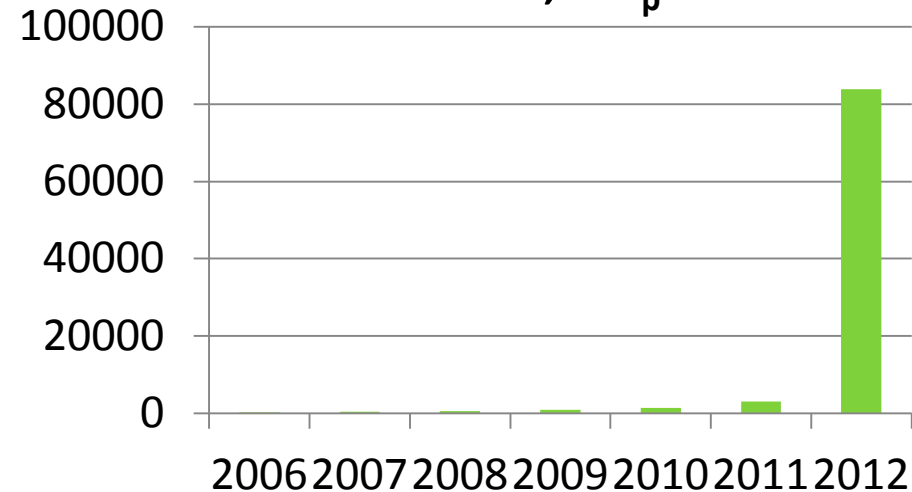
Grid connected PV power stations in Peru

4 PV solar farms of 20 MW_p each, in the south of Peru, grid connected since end of 2012; concessions for 20 years, ~ 75 M\$ each, ~22 ctsUS\$/kWh, ~ 100 ha each; 2 with cristal-Si panels, tracking (Solarpack/Yingli)
2 with α-Si, thin film, panels, fixed (T-Solar)



Opening, La Joya,, President Humala

PV panel imports of Peru, kW_p



Grid connected wind power stations in Peru

Installed capacity (2012):	0.7 MW
In construction (2013):	114 MW *
Commissioned (2013):	32 MW **

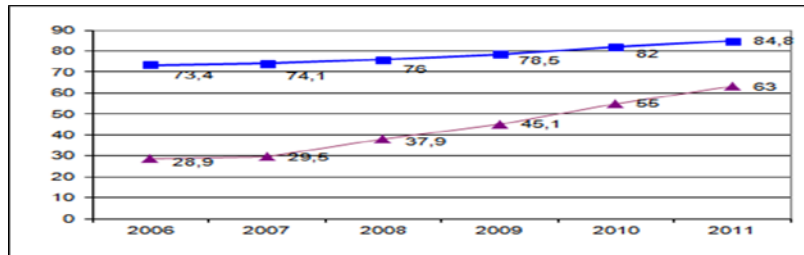
* 2 wind parks at the north coast of Peru;
(Talara, Cupisnique)
to get grid connected at the end of 2013:
63 turbines of 1.8 MW,
270 MUS\$, 8.7 ctsUS\$/kWh
(Contour Global, Vestas)

** 1 wind park at the south coast of Peru,
(Marcona) 32 MW (8x3.15 MW+3x2.3 MW
to get grid connected in 2014



450 kW wind turbine, Marcona
Operating since > 20 years

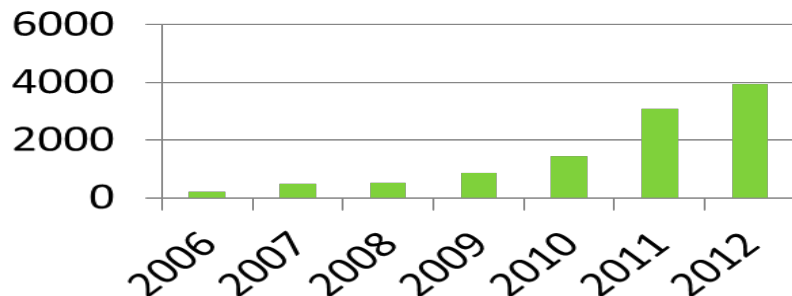
Rural electrification




National and rural electrification (%)

**5 million of Peruvians, living in rural areas, still do not have electricity.
For many, off-grid PV is the cheapest and most reliable solution.**

**PV panel imports of Peru
off grid, kW_p**





PERÚ

Ministerio de Energía y Minas

Viceministerio de Energía

Dirección General de Electricidad

"DECENIO DE LAS PERSONAS CON DISCAPACIDAD EN EL PERÚ"
"AÑO DE LA INVERSIÓN PARA EL DESARROLLO RURAL Y LA SEGURIDAD ALIMENTARIA"

CONVOCATORIA DE SUBASTA PARA GENERACIÓN DE ELECTRICIDAD CON ENERGÍAS RENOVABLES

AVISO PREVIO

En el marco del Decreto Legislativo N° 1002, conforme al Reglamento de Generación de Electricidad con Energías Renovables aprobado con Decreto Supremo N° 012-2011-EM, modificado por Decreto Supremo N° 024-2013-EM, y al Reglamento para la Promoción de la Inversión Eléctrica en Áreas no Conectadas a Red aprobado por Decreto Supremo N° 020-2013-EM, se publica el presente Aviso Previo a la fecha de convocatoria de subasta para generación de electricidad con energías renovables, prevista para el 12 de agosto de 2013.

La Energía Requerida anual en dicha subasta será 320 GWh anuales a ser cubiertos al 100% de partición de la tecnología biomasa. Adicionalmente se requiere 1 300 GWh anuales en base a nuevos proyectos hidroeléctricos.

Así mismo, se requiere hasta 500 mil sistemas fotovoltaicos a ser instalados (incluye operación y mantenimiento durante el plazo contractual conforme al Reglamento) en zonas rurales y aisladas del país, denominadas "áreas no conectadas a red" a ser precisadas en las Bases.

Los interesados en ser Postores deberán registrarse en el Sistema de Información habilitado por OSINERGMIN en su Portal de Internet, conforme a los mencionados Reglamentos.

MINISTERIO DE ENERGÍA Y MINAS

The Ministry of Energy and Mines has started a bid for the installation of up to 500 000 solar home systems till 2016

Solar home systems (SHS) in Peru

SHS installed *

till 2011:	~ 20 000
2012-2013:	~ 7 000
2014 - 2016	≤ 500 000 **

* By central and local governments

** A bid started in august 2013 by the Energy Ministry

The electricity rate for SHS (50 – 320 Wp) in rural areas is regulated by OSINERGMIN (the public supervisory agency) and ~ 80 % is cross subsidized (urban electricity users pay a tax for rural electrification)



Source: I. Salazar, in GIZ journal AMARAY, Nr.2, Nov. 2012

Light for the poorest, with Pico PV

Rural grid connected households consume in Peru, on the average, 12 kWh/month, mainly for lighting, using incandescent light bulbs. The same luminous energy can be obtained with a modern Pico PV system (2 W LEDs, 5 Wp PV)



With the support of GIZ, CER-UNI tested in 2011 eleven different LED lamps in the laboratory.

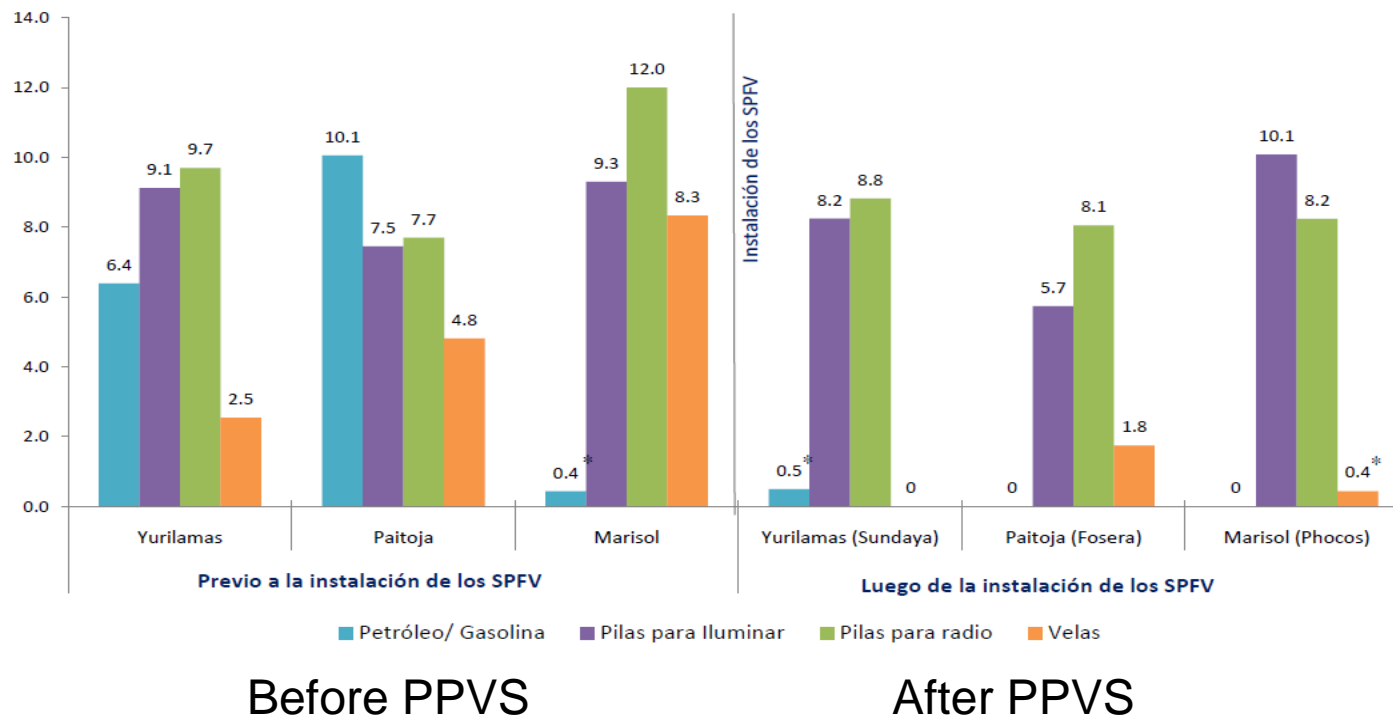
GIZ made then a 8 month field test with the best lamps, followed by a laboratory evaluation of the used lamps. The main conclusions of these studies are indicated in the following transparencies. *

* The complete report is published in the proceedings of the 3rd Symposium "Small PV-Applications", Ulm, Germany, June 17-18, 2013

Economic evaluation

(after 8 months of use)

- People with a PPVS saved, on the average, nine to twelve soles (three to four Euros) per month because of the minor consumption of candles and diesel oil for the lamps, up to 30% of the money used for energy.



Pico PV: Conclusions

The access to modern energy for illumination and communication can produce important local impacts on a social, economic and ambient level, without pretending the substitution of future electrification programs offering more possibilities.



Pico PV Systems (PPVS) are a technology capable to solve basic needs of illumination and communication with a fast impact in families in rural areas of Peru far away from electricity grids.



With a minimum budget and simple and versatile technologies you can help to improve the health, economy and general welfare of nearly three millions of Peruvians now, without the necessity to wait for a more powerful electrification in a not defined future.

Solar energy for the development of remote Andean rural areas

Thermal applications: Solar water heaters for productive and domestic use, Green houses, Solar driers, solar cookers

Heating (important in the high Andean regions): “Solar houses”

Research with new technologies: new materials for thermal isolation, “radiation walls” in Raymina, Ayacucho



Source: R. Espinoza, CER-UNI