



Introducing the project REGSA –
Promoting Renewable Electricity Generation
in South America

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Research and Transfer Centre „Application of Life Sciences“



Promoting Renewable
Electricity Generation
in South America



Hochschule für Angewandte Wissenschaften Hamburg
Hamburg University of Applied Sciences

4 Departments: Life Sciences, Technology & Computer, Economics & Social Studies, Design & Media

5 Competence Centres: interdisciplinary, across all departments

CC4E: Competence Centre for Renewable Energy and Energy Efficiency

Research and Transfer Centre
„Applications of Life Sciences“

Key themes are **renewable energy, water, climate** and **sustainable development**
We are worldwide active and run a set of projects
We cover the whole project cycle: from application to management and reporting
We specialise on technology transfer and applications of techniques, as well as networking





Promoting Renewable
Electricity Generation
in South America

Project REGSA

Promoting Renewable
Electricity Generation in
South America





Promoting Renewable
Electricity Generation
in South America

Rationale

- Apart from environmental benefits, **Renewable Energy** offer great **potential for the local socio-economic development**.
- As Renewable Energies can be **produced locally**, they provide a wide range of **local jobs opportunities** (from high-skill to low skill, from high-tech to agriculture), foster **local investments** and reduce the **dependency on importing of fossil fuels**.
- Potential for **electrification of rural and remote communities**
- Most countries have strategies and plans to foster renewable energy generation, however, the actual implementation is hampered by a **wide range of legislative, financial, political and technological problems**.
- REGSA projects provides support to the **policy makers, decision makers, energy providers , private sector and citizens** to overcome the barriers for **increasing use of renewable energy for electrical power generation in South American countries**.





Promoting Renewable
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in South America

Partners overview



Hochschule für Angewandte
Wissenschaften Hamburg
Hamburg University of Applied Sciences

GERMANY



BOLIVIA

CHILE



UNISUL
UNIVERSIDADE DO SUL DE SANTA CATARINA

BRAZIL



Hochschule für Angewandte
Wissenschaften Hamburg
Hamburg University of Applied Sciences



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in South America

Objectives

Overall objective of REGSA

- contribute to the increasing use of renewable energy for electrical power generation in South American countries.

Specific objectives of REGSA

- To identify and disseminate the technical and socio-economic potential of renewable energy power generation in SA
- To raise awareness and support the regional dialogue of key public and private actors and decision-makers about renewable electricity generation in SA
- To support selected pilot communities/regions in the development and implementation of viable renewable electricity generation projects.

www.regsa-project.eu





Promoting Renewable
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Activities

- Baseline Study on Renewable Energy Generation
- Renewable Electricity Generation Scenarios
- Pilot Action – Renewable Electrical Energy Communities
- Awareness raising & Dissemination Activities

The screenshot shows the REGSA website interface. At the top, there is a banner with the REGSA logo and the text "Promoting Renewable Electricity Generation in South America". Below the banner, there is a navigation menu with links: Home, Project Information, Objectives, News, Events, Local Activities, Final Conference, Partners, Downloads, Network Registration (highlighted), and Contact / Imprint. To the right of the navigation menu, there is a search bar and a font size selector. The main content area contains a registration form with the following text: "If you would like to receive more information about the REGSA project network, please register here. We will provide you with more information. All data will be handled confidentially and will not be given to other organisations." Below this text, there is a note: "Fields marked with * are required." The form fields are: Title * (dropdown menu), Name * (text input), First name * (text input), and Email * (text input). To the right of the form, there is a photo of two people working on solar panels. Below the photo, there is a section titled "Latest news" with a link to "Summary: REGSA - Renewable Electricity Generation in South America".

FONT SIZE [bigger](#) [smaller](#) [reset](#)

[Home](#) [Network Registration](#)

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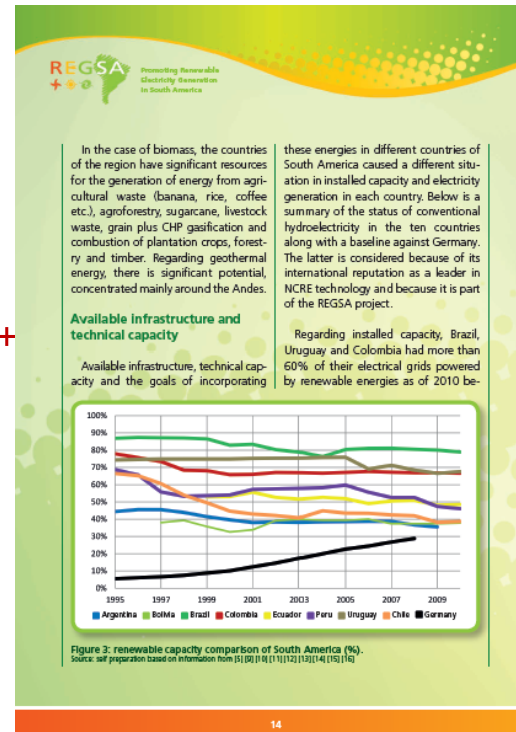
Email *

Latest news
[Summary: REGSA - Renewable Electricity Generation in South America](#)

Baseline Study

**Comparative analysis of political/
institutional framework and RE
infrastructure of 10 SA countries +
Germany**

**identify weaknesses
and opportunities to
consider in order to
promote the
massive integration
of RE in the region.**



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7

Baseline Study

6 SA and 8 EU **Best-practice cases**
for the integration of renewable
energy in electricity grids

**Successful
experiences that
may be replicated in
other countries as
key tools for the
integration of RE in
power grids**

10 GERMANY

Biogas production in Rottweil-Hausen region- Baden-Württemberg



Promoting Renewable Electricity Generation in South America (REGSA)

Figure 10A: Feedback in situ

Plant description	
Biogas co-generator:	
Electrical performance:	526 kW
Thermal performance:	560 kW
Fermenter:	
Useful volume:	2 x 1900 m ³
Material:	armoured concrete
Final storage:	
Useful volume:	5,100 m ³
Material:	armoured concrete
Silo:	
Useful volume:	13,500 m ³
Material:	armoured concrete
Production specification:	
Power input:	approx. 4,000,000 kWh/a
Heat production:	approx. 4,000,000 kWh/a
Heat utilization:	approx. 3,000,000 kWh/a
CO ₂ savings:	2,000 t/a



Source: Barchiesi, 2011

10.2 Financial Profile

The investment total costs amount to 4.2 million euro.

The project implementation has been co-financed by the energy supplier ENBW Support Programme District Heating House Connection Houses with:

- subsidies in the amount of 500 euro for the costs of connection to the grid
- free building thermography in the amount of 199 euro
- all-inclusive assistance by the ENBW for the restructuring.

10.3 Involved Policy and Regulation

According to the Agency's for Renewable Resources (Agentur für Nachhaltige Rohstoffe e.V. / NHR) guidelines for biogas production in general and utilization in co-generation electricity and heat production, the following legal and administrative frameworks have to be considered (BfN, 2010 and German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, 2010):

- According to the Act on Granting Priority to Renewable Energy Sources, so called Renewable Energy Sources Act (Gesetz für den Vorrang Erneuerbarer Energien so called Erneuerbare-Energien-Gesetz / EEG) from 1st April 2000, last amended in April 12th 2011 generation of electricity from renewable sources is eligible for

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5 CHILE

The ESUSCON Rural Electrification Project



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distributed renewable resources in the area, providing 24-hour electricity service. Because the village experienced problems with the water supply system, a management solution was also included in the microgrid. Additionally, a demand-side option to compensate the generation fluctuations due to the renewable sources was considered. The system is composed of two photovoltaic systems, a wind turbine, the existing diesel generator unit of the village (typical in isolated locations), an energy storage system (ESS) composed of a lead-acid battery bank (LABB) connected to the grid through a bidirectional inverter, a water pump and a DSM (load). Figure 5.8 summarizes the power schematic of this microgrid.

These elements are commanded by a central Energy Management System (EMS) that provides signals for optimizing their operation according to load and resources forecasts in order to minimize the consumption of diesel and keep the power quality indicators close to optimal values. Additionally, it includes a demand side management system, which sends to the customer visual information about recommended daily load profiles according to forecasted resource availability; actual consumption data is recorded and sent back to the EMS through smart metering (Palma et al., 2010).

- The following are the main goals of the EMS:
- Minimize the use of diesel
 - Deliver active generation set points for the diesel generator, the ESS inverter and the PV plant
 - Turn on and off the water pump in order to keep the elevated water tank level within predefined limits
 - Send signals to consumers promoting behavior changes

In field implementation, the diesel generator and the ESS inverter have two configurable droop curves to follow the set points. Q-V and P-F droop curves are normally configured for typical operation states that change when receiving adequate signals from the EMS.

When the EMS turns on the diesel generator, it is convenient to start the LABB charge. In that case, the diesel generator is configured to work in incoherent mode (with infinite slope in both curves, takes all the variations between generation and load, following the rated values $W_{DG} - W_{DG}^{min}$), and the ESS inverter curves are configured to follow the charging profile of the batteries.

Figure 5.2: Renewable-based microgrid Power schematic



Source: Energy Center, Universidad de Chile

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Activities

Renewable electricity generation scenarios

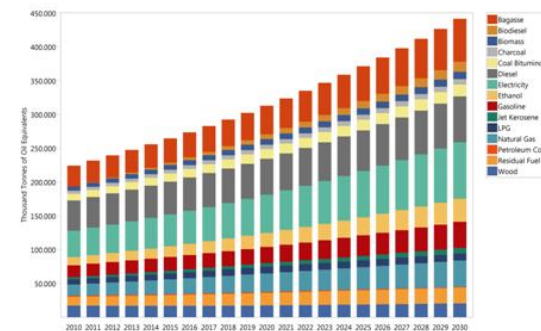
Bolivia, Brazil and Chile

Mitigation Scenario

Projections of electricity supply (2007-2025)

	2007		2015		2020		2025	
	GWh	%	GWh	%	GWh	%	GWh	%
Baseline scenario								
Thermoelectric	34.126	60,41%	49.321	60,52%	47.339	48,02%	73.710	57,42%
Hydroelectric	22.353	39,57%	31.130	38,20%	48.985	49,69%	52.402	40,82%
Geothermic	0	0%	589	0,72%	1.788	1,81%	1.788	1,39%
Wind	11	0,02%	460	0,56%	460	0,47%	460	0,36%
TOTAL	56.490		81.499		98.572		128.360	
Mitigation scenario								
Thermoelectric	34.126	60,41%	46.021	58,85%	43.988	46,44%	66.683	54,96%
Hydroelectric	22.353	39,57%	31.130	39,81%	48.940	51,67%	52.402	43,19%
Geothermic	0	0%	589	0,75%	1.788	1,89%	1.788	1,47%
Wind	11	0,02%	460	0,59%	460	0,49%	460	0,38%
TOTAL	56.490		78.200		94.716		121.333	

Demand by fuels (Ktoe)





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Activities

Pilot Communities for renewable electricity generation

- **feasibility study** for RE project
- **Information events** and round tables for regional stakeholders
- **Capacity-building programme**, including training and coaching on technical, management and financial topics

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Pilot Project Bolivia

Unidad academica campesina Carmen Pampa

543 students - Two experimental production units: Coffee industry + Pig farm

An energy system allows:

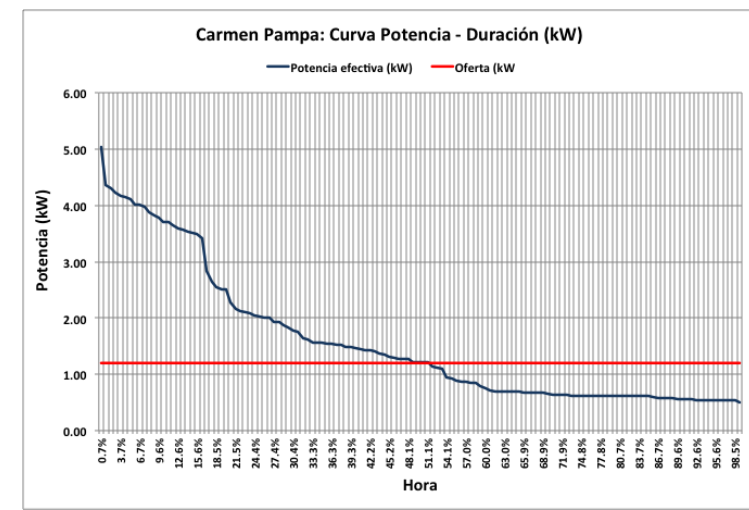
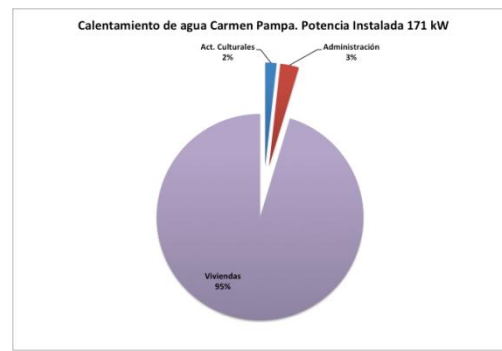
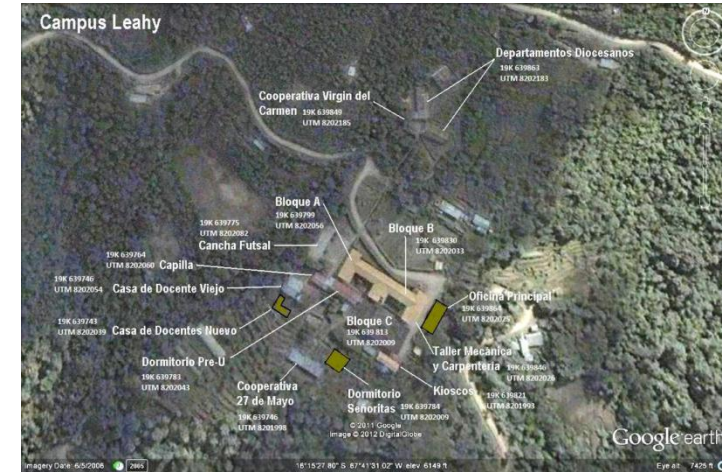
Saving energy costs and improve the budget for experimental production activities.

**To improve the comfort of the students
Reduce energy consumption from NIS**

Through:

Installation of a MCH sytem using the actual water community system

Installation of termosolar system for water heating.





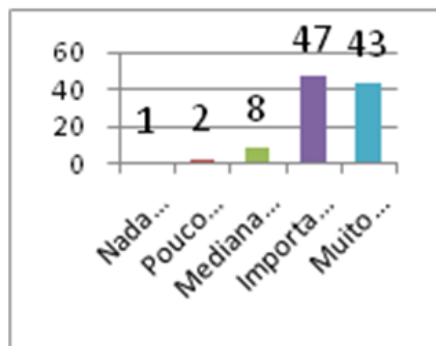
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Pilot Project Brazil, RANCHO QUEIMADO

MICRO HYDRO / ENERGY EFFICIENCY STUDIES IN THE ELEMENTARY SCHOOL ROBERTO SCHÜTZ



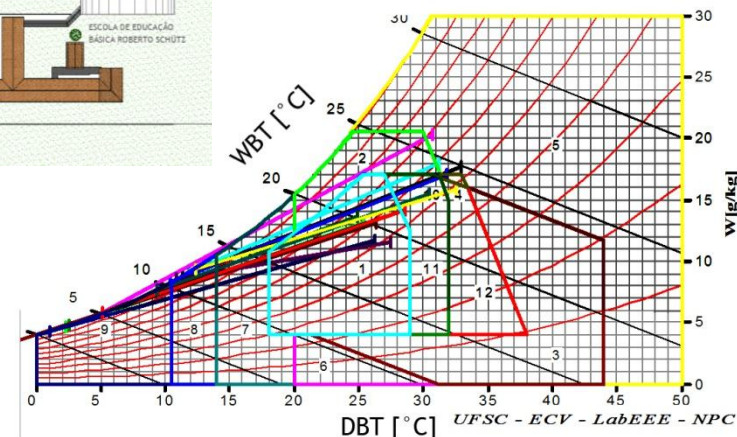
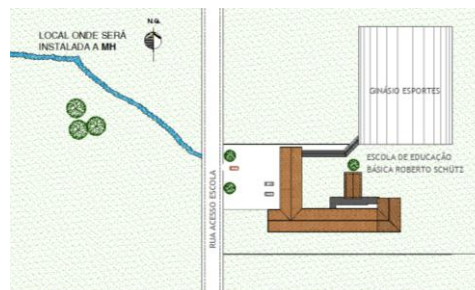
SOCIAL FEASIBILITY



HOW IMPORTANT DO YOU CONSIDER
THAT THE ENERGY SUPPLY TO
RANCHO QUEIMADO IS FROM CLEAN
AND RENEWABLE SOURCES?

Valid interviews in this issue: 198

- 1% - nothing important
- 2% - Minor
- 8% - medium-Important
- 47% - Important
- 43% - very important



Pilot Project Chile, Huatacondo

Renewable Energy for local rural transportation

1- To have a vehicle that allows diminishing fuel consumption for load transportation. It is design from and for local requirements.



Specialized
EV

Mobile
Generator



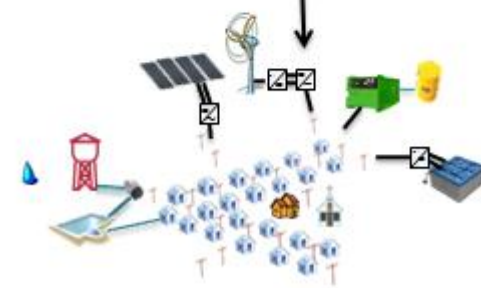
3- Broad
(geographically)
the possibility of
deliver and
receive energy.



EV

Network
connection

2- Create a bi-
directional
connection with
the power system
and explore its
applications





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Newsletter AZ101

Welcome to the fourth REGSA newsletter

The REGSA (Promoting Renewable Electricity Generation in South America) project is a co-operation scheme in extending awareness from Germany and South America, specifically Bolivia, Brazil and Chile.


The aim of REGSA is to contribute to work increasing the use of renewable energy generated using renewable energy sources in South America as a way to improve environmental conditions and energy efficiency, energy security and provide poverty in the areas where the project is active. Furthermore, it directly supports sustainable energy options in the partner countries. To achieve this goal, new electricity grids are due to be established which will integrate the use of renewable energy as a source of electrical energy. These grids are to be developed especially in rural areas. In addition, extensive baseline studies as well as capacity building with regard to renewable electricity generation will be carried out, including political, technological and socio-economic aspects. On-farm activities will be carried out to raise awareness and practical support in order to improve the planning and design of power networks. Furthermore, infrastructure feasibility studies on an annual basis should eventually lead to the increased use of clean energy technologies. Finally, REGSA will give direct support to three pilot communities in the form of a feasibility study as part of the pilot project, renewable electricity communities. This will facilitate regional dialogue and capacity building which can subsequently be used as a best-practice model for other regions in South America. The REGSA newsletter gives an insight into the efforts made by the different partners. It reports news about their projects and gives an overview of upcoming activities.

Photo: Ludwig Veronika Schulte & Julia Costas

News from Bolivia

RIO-20 Opportunities and Challenges for Bolivia

On 17 October, the conference "RIO-20 Opportunities and Challenges for Bolivia" was hosted jointly by the REGSA Project and CIAA project by the Catholic Bolivian University with the participation of representatives for each sector: the government, the public and reports from six institutions that were present in Rio de Janeiro in June. The objectives were to ascertain the main aspects of Bolivia's position on RIO-20 and to synthesise the opportunities that the conclusions of this conference offer Bolivia in terms of renewable energy, climate change and capacity building. The conference received very



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Name *

First name *

Email *

Latest news

Summary: REGSA - Renewable Electricity Generation in South America





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Thank you for your attention !

Contact

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Please register here for the project network!



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Project is funded
by the European
Union.