Sustainable rural communities

Centro de Energía Renovable y Calidad Ambiental

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INTRODUCTION

In Mexico, there are more than 500,000 homes without electricity and 43,000 towns waiting for electrification. This fact impacts the benefits that the use of energy provides to homes, schools, hospitals, public and/or local institutions. Baja California Sur (B.C.S.) has great potential for generation of renewable energy, since its desert conditions favor the state with a large distribution of solar resources. In some areas of the region, the average solar irradiation has a value of 6.2 kWh/m2/day compared to other countries that have a maximum average irradiation of 5 kWh/m2/day. In regards to wind potential, some of the coastal areas of B.C.S. have a wind speed of 5.5 and 6.5 m/s, which is sufficient to develop energy projects with wind technology (Government of B.C.S, 2015).

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INTRODUCTION

Particularly in our state, the coverage of the population with electric power service in 2020 was 98.55%, (SEMARNAT, 2021), additionally 63 communities are located in rural areas that are outside the state electrical grid. In the year 2022 the Center for Renewable Energy and Environmental Quality (CERCA), carried out a diagnosis in 14 rural communities, in order to assess the electricity needs of these communities. The main findings are centered on the following categories:

- Cooling
- Connectivity
- Climatic and domestic comfort
- Recreation

Communities of Baja California Sur

Figure 1 Municipal program for the rehabilitation of photovoltaic equipment

Figure 2 Common refrigerator in Puerto Chale

Figure 3 Solar panel of the homes in Puerto Chale 250 [W]

Figure 4 Photograph of the power generator of the community of San Luis Gonzaga

Figure 5 Electric Center of El Dátil

Figure 6 Road to reach the community of Agua Verde

Table 1 Example of tariff schemes in rural communities

Commercial Rate		***Domestic Rate***	
Energy consumption	***Price***	***Energy consumption***	***Price***
0 kWh a 50 kWh	*$2 pesos*	*0 kWh a 50 kWh*	*$2 pesos*
51 kWh a 150 kWh	*$3.25 pesos*	*51 kWh a 150 kWh*	*$2.25 pesos*
<151 kWh	*$4 pesos*	*151 kWh a 300 kWh*	*$3.25 pesos*
		<300 kWh	*$4 pesos*

Note: Own elaboration with CERCA diagnostic data

Figure 7 Photographs of the activities in the communities of the municipality of Comondú

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Figure 8 Photographs of the activities in the communities of the municipality of Loreto

Figure 9 Photographs of the activities in the communities of the municipality of Mulegé

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Conclusions

The communities have stated that there is a need to train them on the use of photovoltaic systems. Likewise, they made clear the need for follow-up programs for maintenance, as well as focused solutions for connectivity, refrigeration, leisure and home activities specific to rural life that require constant physical effort.

Solution: Renewable energy kiosk

Design and implement renewable energy kiosks for communities in the fishing and agricultural sector.

Cost per kiosk unit with electrical appliances.

$6,900 USD

Description	Unit Cost		Total
	Unit gear	Maintenance	
Kiosk manufacturing	4, 000 USD	800 USD	4, 800 USD
Electrodomestic kit for kiosk	1, 600 USD	200 USD	1, 800 USD
Kiosk implementation	300 USD		300 USD

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Methodology:

Work with local universities for the manufacture of renewable energy kiosks.

Manufacture of renewable energy kiosks for communities selected.

Implementation of kiosks in the communities by young people from local renewable energy career colleges.

Record the benefits to the community from the implementation of renewable energy kiosks.

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Impact

Target 834 homes in 12 communities.

2009 people to be benefited.

Help close the inequality gap between rural and urban communities and reduce energy poverty

480 male and female engineers will receive training.

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We need your support for the communities of Baja California Sur by donating for the manufacture and implementation of the kiosks of renewable energy. The first phase includes 482 kiosks in 12 rural, agricultural and fishing communities in conditions of high and very high marginalization.

Let us be the engine that drives change in the lives of thousands of people, creating sustainable rural communities.

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We work together for an electric system that is sustainable and resilient.