

# Remote Home Lighting Extension Service

A REDI INITIATIVE



## *RENEWABLE ENERGY DEVELOPMENT INTERNATIONAL*

### **Project Objectives**

Spread the benefits of electricity to the wider community. Provide a healthy and high-quality alternative to the use of kerosene for home lighting, thereby eliminating the adverse health and environmental impacts of burning hydrocarbons in closed rooms.

### **Project Features**

- unused off-peak power charges portable gelcell batteries at convenient stations
- carried home to power three tubelights
- fees are less than previously purchased kerosene
- the off-peak power for charging is almost free
- Fail-safe features are designed-in

### **Project Benefits**

Removal of kerosene from the environment has immediate impact on public health realities. Electric lighting inherently improves literacy, and also tends to reduce birth rates. Cash previously spent on kerosene will be redirected to the local hydro facility, which is strengthened as a key public institution.



**S**CECO, the Salleri/Chialsa Electric Company, is a joint Swiss/Nepali rural electrification scheme located in the Mt. Everest region of Nepal. REDI proposes to use the facility's excess capacity for a unique program to extend the benefits of electricity beyond the reach of SCECO's present grid lines. This is done by using the facility's off-peak capacity to charge storage batteries, which are carried home by remote householders to power electric lighting. In this simple way, the benefits of electric light can be made available to 30% more people in the community, without substantial investment. The service is fee-based, and households will not be charged more than they presently pay for kerosene, and they will no longer have to buy, porter, or burn fuel for lighting.



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## The SCECO Extension Program

SCECO, the Salleri/Chialsa Electric Company, is a joint Swiss/Nepali rural electrification scheme located in the Mt. Everest region of Nepal. REDI proposes to use the facility's excess capacity for a unique program to extend the benefits of electricity beyond the reach of SCECO's grid lines.

REDI has chosen SCECO as a partner for this project, because of SCECO's sterling record of management and delivery of service. It has been widely praised as the best managed and operated hydro-electric facility in the country. It has a Board of Directors composed primarily of local stakeholders, and is not a governmental entity. It has a capacity of 400 kilowatts, and during the evening hours of every day, its full capacity is in demand. It has reached the limit in the number of households it can service with peak grid power. SCECO's user-base is 1300 households connected to its grid, so this program would significantly extend the facility's service area by another 300 to 400 households.

REDI's program is to use some of SCECO's off-peak capacity to extend its service area to a wider community, by establishing a battery-powered home lighting service for homes which are outside of its grid area.

During the off-peak period of each day, 75% of SCECO's capacity is unused and is available for other purposes. Because this is a run-of-river hydro scheme, there are no "fuel" costs, and the only added expenditure for running at higher output during off-peak hours, would be a minimal amount of added maintenance and staff time.

Specifically, this simple program works in the following fashion: the participants' homes are fitted with three 20 watt/12volt tube lights, and a voltage regulator. A user carries home a charged battery from one of SCECO's charging stations which will be located at appropriate points along the edges of its service area, so that these stations are within easy reach of the remote clients. The user then connects the battery to the home's wiring via an integral plug which



cannot be mistakenly reversed in polarity. This electrical power transits through the voltage controller which shuts off power to the lights when the battery falls to a set voltage. This prevents the battery from being ruined from over-discharging, and ensures long battery life. The user then enjoys electric light for approximately a week. When the battery is exhausted, the user carries it to town and exchanges it for a charged battery for a small fee. There would be no need for the patron to wait while their battery is charged. Most families in this area walk to town at least once per week, and are quite used to carrying heavy loads. The batteries will be sized so that users will not have difficulty carrying them.

Each of the homes in the program will need three 12volt/20watt tube lights installed (at a cost of US\$25), and a simple station w/ regulator where the battery is connected to the wiring for the operation of the lights (cost: \$15). The cost for a 30AH gelcell battery is about \$60, so the entire cost per household to set-up the program is approximately US\$100. Other expenses are the cost of equipment which will be used by SCECO to charge the users' batteries at its several charging stations, as well as a stock of spare batteries, bulbs, etc.

The batteries will be sealed gel-cel, deep-cycle type, so that issues of spilled acid are obviated. The service is fee-based, but will be price-calculated to approximately the same cost per household which each is already spending on kerosene for home lighting, or less.

The program will create jobs at SCECO, which is a primary employer in the area, and it will spread the benefits of electric lighting to approximately 30% more people than it can currently serve on its grid. Electric lighting will allow people to read and work in the evening hours in much better luminance than kerosene lamps, and it removes the public health and environmental impacts of burning kerosene for lighting in closed rooms.

The program costs to be incurred are for start-up only, since the program should be self-sustaining through fees, once established. Initial costs will be one-time expenses for the purchase of a limited amount of basic equipment for the program such as batteries, wire, 12volt lights, regulators, connectors, and switches. Initial costs are not intended to be recouped by either the funding partners or REDI. Once it is established, the program will be self-expanding: user fees pay SCECO's future costs to bring more users into the program.

This is a pilot program test case, and is important so that we can understand the needs and issues involved with replicating this concept in other communities in the world which have similar excess off-peak capacity at their local hydro facilities.

REDI's strategy is to build a new program within this public institution, by formulating a method to help the community manage this collective asset.

**BUDGET: This is a basic budget for a 50 home pilot project.**

1) Gel-cell batteries (30AH) x 80 @ \$60ea.	\$4,800
2) Tube lights (20watt/12volt) x 200 @ \$5.60ea.	1,120
3) Heavy-duty charging equipment for use in remote charging stations	5,000
3) Wire, screws, wire channel, switches, regulators, breakers, etc.	3600
4) Labor and transport	5,000
5) REDI's costs (staff, travel, food, local fees)	5,000
6) Contengencies	2,000
<b>Total Budget -</b>	<b>\$26,520</b>