businessmasters2007
international case studies

Final Case of Business Masters 2007

[Business Masters Karlsruhe e.V.]

Summary

- In the pre-case you helped a social entrepreneur to evaluate the possibilities of deploying “Solar Energy Units” in Africa. “Solar Energy Units” provide a means to benefit from solar energy.

- You proved expertise and good judgment on exploring a promising solution for the implementation of a valid project with “Solar Energy Units” in an appropriate region. You and your team are invited to an annual start-up contest hosted by the Faculty of Economics at the University of Karlsruhe, supported by Booz Allen Hamilton and BASF.

- You will now have the chance to develop services and applications around the “Solar Energy Units” and present your new and exciting business plan during the finals.

- The project will be situated in the fictitious region of Inlanga in East Africa. Show your entrepreneurial spirit and start building a business with “Solar Energy Units”.

- Seize the opportunity to create an innovative idea around the “Solar Energy Units” and leverage the welfare of Inlanga...

Background

Half a year ago you and your team arrived in Inlanga, a small region in East Africa. You decided that Inlanga is the adequate region for your plans to start a business with “Solar Energy Units”.

Many years of conflicts and economic decline have destroyed great parts of the infrastructure in Inlanga as well as human belief in prosperity. Almost all investments have been recalled and the people of Inlanga suffer from poverty and unemployment. The main pillar of Inlanga’s economy, agriculture, has been weakened by droughts and floods causing a lack of nutrition for a long time.

For about three years the circumstances have been beginning to recover and the people of Inlanga are starting to believe in a positive future. It is your mission to take a lead in this situation and help the people of Inlanga with a convincing entrepreneurial concept based on “Solar Energy Units”.

Since you have arrived in Inlanga, you have collected some information about your target region:

Demography - Key figures	
▸ Total	▸ 3.5 million
▸ Density	▸ 95 inhabitants/km^2
▸ Growth	▸ 3.0% p.a.
▸ Age Structure	▸ *0-14 years:* 50.2% *15-64 years:* 47.6% *65 years and over:* 2.2%
▸ Literacy (age 15 and over can read and write)	▸ *Total:* 55%

Economic Development

Inlanga has seen economic recovery over the last three years, and the country's macroeconomic environment has become more stable. GDP growth picked up recently after stagnating for many years. The economy grew at 4.4% in 2005, 5% in 2006 and is expected to grow at around 5.4% in 2007.

The recovery over the past years has been broad, cutting across key sectors (e.g., tourism, agriculture, manufacturing, transport, communication, and commercial sectors). Also, more investors are reporting that they can now do business without political interference. Many people in the region develop a certain consciousness for their rich environment and put Inlanga on the forefront of a new type of business, eco-tourism.

Economic - Key Figures	
GDP – current $ US	1.09 billion $ US
GDP – real growth rate	5.4%
GDP – by sector	Agriculture: 39.5% Industry: 14.6% Services: 45.9%
Labor force	1.5 million
Labor force – by sector	Agriculture: 86.7% Industry: 3.8% Services: 9.5%
Unemployment rate	Very high
Percentage of people living below poverty line	40%
Inflation rate	6%
Agricultural products	Coffee, tea, cotton, tobacco, cassava (tapioca), potatoes, corn, millet, pulses, cut flowers; beef, goat meat, milk, poultry
Industrial products	Brewing, tobacco, cotton textiles

Energy Supply

The inefficient supply (distribution losses exceed 50%) and use of energy, combined with poor coordination between government institutions, the private sector and various energy-related projects, are key problems for the Inlangan economy. The current energy crisis, resulting from shortages in electricity, has severely affected the regional economy, reducing annual economic growth by 1.5 – 2%.

Also, the rural population is not able to access modern and efficient energy services. 93% of the population still use biomass for cooking, depleting the already scarce forest resources. Only 3% of all Inlangans living in rural areas have access to electricity, thus limiting the possibilities for their social and economic development.

Electricity consumption per capita	30 kWh/year	
Access to electricity in percent of total population	3%	includes on-grid and off-grid
Oil consumption per capita	22.8 l/year	
Biomass consumption per capita	400 l oil equivalent/year	
Energy consumption – by sector	*Residential:* 75.2% *Commercial:* 12.0% *Industry:* 8.4% *Transport:* 4.4%	
Share of total household expenditure on energy	6.5%	
Average solar radiation	5.5 kWh/m^2	

Assignment

During the last six months you have built up a lot of contacts to important persons and institutions in the region and your home country. These partners will help you to start your business in Inlanga and will accompany you in this challenge.

Prepare yourself and your team to present your ideas on Friday, 23rd of November, in front of a board consisting of the following members:

Your investors:

Recently you offered *InvestInAfrica Corp.* your idea of using "Solar Energy Units" for a business model in Inlanga. The company is involved in various investments in Africa and follows a profit-oriented, realistic strategy. They were highly interested in your ideas and decided to visit you in Inlanga.

Your patron:

While you were investigating in Inlanga, you met some staff working for the development organization *HelpInlanga*. They supported you in making contact with the people and see a good opportunity to advance their help for Inlanga in your engagement. *HelpInlanga* offers you further assistance and sponsorship for your business idea, e.g. facilitates access to the local infrastructure or to subsidized loans. *HelpInlanga* makes the scope of their assistance and sponsorship partly dependable on how much a project accomplish the UN Millennium Development Goals. The eight Millennium Development Goals (MDGs) – which range from halving extreme poverty to halting the spread of HIV/AIDS and providing universal primary education, all by the target date of 2015 – form a blueprint agreed to by all the world's countries and all the world's leading development institutions (see Appendix for details). Please be aware that you do not have to fulfill all of them!

Your friends and partners:

You have spoken to a lot of important persons and officials in the region since you have come to Inlanga. You gained their respect and friendship with your ideas. They care about their people and know where problems will appear. They are highly interested in your project and will support you, if you keep the needs of the population in mind.

Solar Energy Units

Technical Details of "Solar Energy Units"

"Solar Energy Units" (SEU) provide a means to benefit from solar energy. They enable the operation of small electricity grids or the accumulation of heat. The "Solar Energy Units", in our case, deliver a performance of up to 50 Wp (Wp = Watt Peak)[1]. The daily output of a SEU highly varies, in average the Solar Energy Units produce 220 Wh per day (Wh/d) in the target region, considering the global radiation of 5.5 kWh per sqm. The energy can be accumulated in batteries – that is not obligatory for the case, feel free to use any assembly your solution requires.

Summary of Technical Details:

- 15 years of lifetime in average
- Nominal Power: 50 Wp
- Average Power/Day: 220 Wh/d
- Weight: 5.9 kg
- Dimensions: (l x w x d) 95 x 45 x 3.5 cm

Price of Solar Energy Units

The average price of a SEU with a performance of 50 Wp (including delivery and maintenance) is 180 $ US. The price covers the delivery and installation of the SEU, a 5-year maintenance guarantee including passing on of manufacturer's guarantees.

Calculation of Total Load required

As an example the consumption of the following devices could be provided by one Solar Energy Unit.

[1] The Watt Peak output of a Solar module is the number of Watts Output when it is illuminated under standard conditions of 1,000 Watts/sqm intensity, 25°C ambient temperature and a spectrum that relates to sunlight that has passed through the atmosphere (AM or Air Mass 1.5).

Consumer	Power (W)	Running time per day (h/d)	Consumption per day (Wh/d)
Radio	5	3	15
Lamp	10	4	40
Color-TV	30	2	60

Calculation of Storage (if needed)

Be aware that in case your solution needs storage, the price for Solar Energy Units does not contain the corresponding costs. E.g., if your business requires battery storage, calculate the size to provide for a number of days of back-up in the event there is no sun or system downtime, the battery bank would need to be rated as follows:
(Total Load x Days of Storage) / System Voltage

E.g. when using a 12 volt car battery:
(155 Wh/d x 2d) / 12 V = 25 Ah at 12V

The size of Ampere-Hours (Ah) determines the price for the battery.

Other costs

Please be aware of possible other costs, i.e. for charge controllers, power inverters or other material your customers will need for the operation of the units.

Appendix – The UN Millennium Development Goals in detail

1. Eradicate extreme poverty and hunger
   - Reduce by half the proportion of people living on less than one U.S. dollar a day.
   - Reduce by half the proportion of people who suffer from hunger.
2. Achieve universal primary education
   - Ensure that all boys and girls complete a full course of primary schooling.
   - Increased enrollment must be accompanied by efforts to ensure that all children remain in school and receive a high-quality education
3. Promote gender equality and empower women
   - Eliminate gender disparity in primary and secondary education preferably by 2005, and at all levels by 2015.
4. Reduce child mortality
   - Reduce the mortality rate among children under five by two thirds.
5. Improve maternal health
   - Reduce by three quarters the maternal mortality ratio.
6. Combat HIV/AIDS, malaria, and other diseases
   - Halt and begin to reverse the spread of HIV/AIDS.
   - Halt and begin to reverse the incidence of malaria and other major diseases.
7. Ensure environmental sustainability
   - Integrate the principles of sustainable development into country policies and programs; reverse loss of environmental resources.
   - Reduce by half the proportion of people without sustainable access to safe drinking water (for more information see the entry on water supply).
   - Achieve significant improvement in lives of at least 100 million slum dwellers, by 2020.
8. Develop a global partnership for development
   - Further develop an open trading and financial system that is rule-based, predictable and non-discriminatory. Includes a commitment to good governance, development and poverty reduction—nationally and internationally.
   - Address the least developed countries' special needs. This includes tariff- and quota-free access for their exports; enhanced

debt relief for heavily indebted poor countries; cancellation of official bilateral debt; and more generous official development assistance for countries committed to poverty reduction.

- Address the special needs of landlocked and small island developing States.
- Deal comprehensively with developing countries' debt problems through national and international measures to make debt sustainable in the long term.
- In cooperation with the developing countries, develop decent and productive work for youth.
- In cooperation with pharmaceutical companies, provide access to affordable essential drugs in developing countries.
- In cooperation with the private sector, make available the benefits of new technologies— especially information and communications technologies