



# Renewable Energy - Journey

## Levan Kobakhidze

### Contents

Application Form

Curriculum Vitae

Training Program

Training Report

Business Plan

Monthly Reports

Final Report from the Fellow

Final Evaluation Report

Prepared by the Youth Employment Summit (YES) Campaign  
December 2004

A project of Education Development Center  
55 Chapel Street  
Newton, MA 02458

Application for  
Renewable Energy  
Fellowship 2003

**Youth Employment Summit – GYSD**  
**Renewable Energy Project**  
A project of Education Development Center

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DATE STATUS

Funded by the Global Environment Facility and the World Bank

**Deadline for Applications: Feb. 28, 2003**  
**Winners will be announced on: April 12, 2003**

Date:

February 28, 2003

1. Applicant First name:	Levan	2. Last Name	Kobakhidze
3. Mailing Address:	6, K. Chachava str., Tbilisi, 380059, Georgia.	4. Country:	Georgia
		5. Telephone:	+ (995 32) 525969
6. City:	Tbilisi	7. Fax:	+ (995 32) 525969
8. State / Province:	-	9. E-mail:	<a href="mailto:levi@gol.ge">levi@gol.ge</a>
10. Postal Code:	380059	For Official Use Only	
11. Secondary contact name:	George Sultanishvili		
12. Email:	<a href="mailto:le_ko@posta.ge">le_ko@posta.ge</a>		
13. Telephone:	+ (995 32) 793734		
14. Full name of co-applicant institution	JSC "SpetsHeliotbomontaji"		
15. Legal Status and date of establishment:	Ltd.		
16. Technical Expertise:	Solar Energy / Manufacturer company		
17. Name of Contact Person:	Badri Natsvlshvili	18. Country:	Georgia
19 Address:	43 merkviladze str., Tbilisi, 380002, Georgia.		
20. City: Tbilisi	21. Postal Code: 380002		
22. Email:	-		
23. Telephone and Fax:	+ (995 32) 958420		
24. Full name of co-applicant YES Network	YES Network Georgia / Green Earth		
25. Name of Contact Person:	Alexandre Grzelidze	26. Country:	Georgia
27. Technical Expertise:	8 years working in renewable energy projects and in training		
28. Legal Status and date of establishment:	NGO; established November 1994.		
29. Address:	4v, Mazniashvili str., Tbilisi, 380002, Georgia.		
30. City: Tbilisi	31. Postal Code: 380002		
32. Email:	<a href="mailto:nugzari@kheta.ge">nugzari@kheta.ge</a>		
33. Telephone:	+ (995 99) 586784		

Please answer the following questions , use additional sheets where needed

34. What is the potential of Renewable Energy in your community?

In Georgia there is a great potential of Renewable Energy. It is supposed that the branch of Renewable Energy Sources using in Georgia has no alternative, all the more that Georgia has considerable resources of this sources. But the given branch is actually not developing. Mainly there is possibility to develop usage of the following Renewable Energy sources in Georgia: wind, solar, water, geothermal and biomass. According to the scientific data in Georgia the wind energy potential is approximately 4-milliard kW/h and water energy potential is approximately 137-milliard kW/h.

Georgia is a sunny country; approximately here sun shines for 200 days a year. And according to the areal average daily radiation changes in the interval: 3.5-6 Kw/m<sup>2</sup>.

35. Describe 2 practical applications of Renewable Energy that can be implemented in your community.

I think that the most perspective 2 applications of Renewable Energy that can be implemented in Georgia are: Photovoltaics and Small Hydroelectric Plants. In this cases we are less restricted by the resources of energy, because the territory of Georgia is full of small mountainous rivers and the average daily radiation on horizontal surface is quite high: 3.5-4.5 kW/m<sup>2</sup>.

36. Is your Government a signatory to the Kyoto Protocol? If so, has your Government ratified it? If so, when was it ratified? If not, then what are the reasons? What is the national energy policy in your country? Is it conducive to promoting Renewable Energy?

Georgia has signed to the Kyoto Protocol in 1998 and the parliament ratified it on 28 May 1999. There is no clearly defined national energy policy in Georgia and our government practically isn't conducive to promoting Renewable Energy.

37. What institutional support is available to you and your co-applicants for developing and implementing your business plan? Please provide names and contact information.

NGO "Sun and Earth" - E-mail: [mze@geo.net.ge](mailto:mze@geo.net.ge)

"Solar Energy" Ltd - E-mail: [solar@gol.ge](mailto:solar@gol.ge)

These organizations will support us by providing all the needed information and technical advices in the field of Renewable Energy.

38. In the past 3 years, what renewable energy projects or ventures have you participated in?

I have participated in the following projects of NGO "Sun and Earth":

1. "Ecologically Clean Energy for the Ecologically Clean Environment" - October - November 2000;
2. "Solar Energy in Service of the Oil Pipeline (The ways of decreasing harmful exhausts of Baku-Supsa oil pipeline on the territory of Georgia)" - December 2000 - June 2001;
3. "Solar Energy in Service of the Cultural Monuments" - January-October 2002;
4. "The Ways of Transboundary Lake Jandara Ecological Amelioration" - March-August 2002;

In these projects my role was to help in: practical installations of PVs, information spreading, bucket publishing, web-site development etc.

I have individually realized the following projects:

1. "The Working Model of the Tracking Solar Photovoltaic Station" - February - May 2000 (this project recieved a Honorary Award on the European Union Contest for the Young Scientists - Amsterdam, September 2000);
2. "The Ways for Decreasing the Solar Photo-energy Cost" - November 2002 - April 2003 (currently under realization).

39. Describe your business proposal in 400 – 600 words.

**Establishment of the Photovoltaic Panels' Production Enterprise and Distribution Network**

Georgia is situated in Caucasus on the East shore of the Black Sea. Our country is rich with helio resources, the average daily radiation falling on horizontal surface is quite high: 3.5-4.5 kW/m<sup>2</sup>. There are also some regions where this parameter is equal to 5-6 kW/m<sup>2</sup>.

Currently in Georgia few companies distributing and installing photovoltaic systems had almost interrupted their activities, because there is no demand on these products. Requirement of such companies is high, as in the last 10 years there is a heavy energy crisis in Georgia. Often even big cities have no power supply during hours, sometimes days. There are also regions that are not supplied by power during months. Many high mountainous areas are not connected to the central electric grid at all. The point is that people don't realize the need and importance of Renewable Energy usage, because of lack of the information in this field and agitation non-existence of alternative sources of energy in Georgia.

Within the bounds of the project there will be held an advertising-agitation campaign. The main goal of this campaign will be: popularization/agitation of Renewable Energy usage, explanation of the climate change danger for the earth and sale of the manufactured PV panels. People must understand that Renewable Energy has no alternative in the future.

The project has two main **goals**:

1. Contribution to the climate change problem by production and spreading ecologically clean power sources such as solar PV panels.
2. Employment of young people for the project realization reasons.

According to the preliminary calculations at the first stage of the project there will be employed 10-15 youth and on the next stage (approximately after one year period) this number should increase three times.

The small enterprise will be established in suburb of Tbilisi and the products will be sold as in Tbilisi, as well on whole territory of Georgia.

On the first stage there will be produced low power PV panels from 1 to 15 watt. As the basic material will be used amorphous silicon crystal modules, which are flexible, elastic, light and very practical in usage. There will be produced portable PV panels of different size, purpose and functionality. Consumers will be able to use PVs: in any situation - in the apartments, on the way, out of town, in the nature etc. And for the various reasons – lighting, charging mobile phones, watching television and listening radio in order to get all the needed information about the processes happening in the world.

In future, approximately 1-2 years after establishing the Enterprise, there will be also added the service of collecting, completing and installing bigger stationary solar photovoltaic systems (hundred of watts).

In case of the project realization a part of the community will understand the goodness of the usage of Renewable Energy sources such as the sun. Many people who live in a high mountainous and off-grid areas will ameliorate their social conditions. They will be able to charge mobile phones (which are commonly the unique communication means), to receive information by means of television and radio and fill the existing information vacuum.

#### Short Budget

#	Expenditures	Amount, USD
1.	Business journey	500
2.	Purchase of materials and semi-finished products	2500
3.	Enterprise area rent	600
4.	Purchase of inventory and equipments for the enterprise	500
5.	Distribution area rent	400
6.	Advertisement/agitation expenses	500
<b>Sum Total</b>		<b>5000</b>

40. Please write any additional comments that you deem important when considering your application.

I am participating in solar photovoltaic systems designing and installations from my childhood and have considerable scientific and technical work experience in the field of solar power engineering.

# Curriculum Vitae

**Date of Birth:** 13.03.1983  
**Place of Birth:** Sukhumi, Georgia  
**Current Place of Residence:** Tbilisi, Georgia

## Education:

- In 1999 I have successfully finished secondary school.
- Currently I'm studying in the Georgian Technical University on the Economics and Informatics faculty, fourth year.

**Languages Spoken:** Georgian, Russian, Italian, English.

**Field of Activity:** Informatics, Economics, Electronics, Renewable Energy, Youth, NGOs.

## Work Experience:

- One year in the private TV:  
I was translating documentary films from Italian language.
- 3 years in the NGO "Sun and Earth" as youth leader;  
I have participated in the following projects of NGO "Sun and Earth":
  1. "Ecologically Clean Energy for the Ecologically Clean Environment" - October - November 2000;
  2. "Solar Energy in Service of the Oil Pipeline (The ways of decreasing harmful exhausts of Baku-Supsa oil pipeline on the territory of Georgia)" - December 2000 - June 2001;
  3. "Solar Energy in Service of the Cultural Monuments" - January-October 2002;
  4. "The Ways of Transboundary Lake Jandara Ecological Amelioration" - March - August 2002;In these projects my role was to help in: practical installations of PVs, information spreading, bucket publishing, web-site development etc.
- I have individually realized the following projects:
  1. "The Working Model of the Tracking Solar Photovoltaic Station" - February - May 2000 (this project received a Honorary Award on the European Union Contest for the Young Scientists - Amsterdam, September 2000);
  2. "The Ways for Decreasing the Solar Photo-energy Cost" - November 2002 - April 2003 (currently under realization).

## Achievements:

- Winner of the George Sores foundation (OSGF - Georgia) contest "I - Young Scientist";
- In "International Telecommunications and Information Centre" (ITIC) web contest was awarded with Honorary Diploma;
- On the "European Union Contest for the Young Scientists" in Amsterdam had received a Honorary Award;
- Have got Georgian national award "Tsinandali" in the branch technical sciences;
- Exhibitioner of the president of Georgia.
- Made a topic "The Ways for Decreasing the Solar Photo-energy Cost" on the "London International Youth Scientists Forum" (LIYSF);

- Made the realized project presentation on “Pan-European Seminar of Sustainable Energy” in Denmark.

**Published Works:**

- Two articles in the scientific magazine “Energy” (2000, #3);
- Patent on the useful model;
- Topic on the seminar “Energy and Environment in Georgia”;
- Stand report on the international conference in St. Petersburg;
- Topic on the “London International Youth Scientists Forum” (LIYSF);
- Two articles in the Ukrainian environmental magazine “Green Energy”;
- One article in the scientific magazine “Science and Technology”.

**Hobbies:**

- Skiing;
- Swimming;
- Football;
- Fishing;

**Fields of Interest:**

- Informatics, Computers;
- Economics, Management;
- Renewable Energy;
- Photovoltaic;
- Digital Electronics;
- Sport;
- Music;
- Art;

# Training Program

## Training Purposes and Schedule

The main goal of the training is to prepare the applicant for business plan writing and its successful realization. According to the existing project the applicant will be prepared in two fundamental directions: Renewable Energies and Economics.

*Training course (200 hours total) will be held within 3 months - about 4 hours a day, 50 days.*

### Training Program Schedule

	General Subjects	Training Time, hours.	Weeks													
			I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII		
1.	<i>Strategic Planning</i>	30	■	■												
2.	<i>Financial Management</i>	15			■	■										
3.	<i>Human Resource Management</i>	15				■	■									
4.	<i>Marketing Management</i>	15						■	■							
5.	<i>Internal / Organization Management</i>	15								■	■					
6.	<i>Program Evaluation / Self-Evaluation</i>	10										■				
7.	<i>Additional Income-Generating Activities</i>	15										■	■			
8.	<i>Advertising Campaign Planning</i>	10														■
9.	<i>Renewable Energy Sources</i>	20			■	■	■	■								
10.	<i>Renewable Energy Usage Efficiency</i>	30						■	■	■	■	■				
11.	<i>Renewable Energy Technologies</i>	25										■	■	■	■	■

### Detailed Information and Studying Methodic of General Subjects

#### 1. *Strategic Planning*

- *What is strategy and why is it important;*
- *Main characteristic features of strategic planning;*
- *The main components of the strategic planning and their detailed analysis;*
- *The mission, the vision of future, weak and strong side analysis, environment analysis, mission revision, problems and solutions;*
- *Work plan creation.*

## **2. Financial Management**

- *Meaning of financial management;*
- *Five steps of budget preparation;*
- *Annual budget preparation;*
- *The different categories and the forms for the annual budget;*
- *Financial policy.*

## **3. Human Resource Management**

- *General review of human resource management;*
- *Selecting and interviewing new staff members;*
- *Career development, organizational mobility and staff transfers;*
- *Career planning and management, staff relocation;*
- *Training and development;*

## **4. Marketing Management**

- *General review of marketing process;*
- *Planning the marketing goals;*
- *Formation of the image goals;*
- *Determination of the place of the organization;*
- *Conducting the marketing audit;*
- *Service and product, society, target audience, price, place and promotion;*
- *Creation of marketing plan;*
- *Planning of marketing campaign and selection of relevant methods.*

## **5. Internal / Organization Management**

- *General review of the internal management of the organization and introducing the necessary components of its success;*
- *Formation of the of the organizational polices;*
- *Internal regulations of the organization;*
- *Financial policy;*
- *Structural model of the organization;*
- *Monitoring of the activities;*
- *Staff evaluation.*

## **6. Program Evaluation / Self-Evaluation**

- *The meaning and the essence of the evaluation and self-evaluation;*
- *The history of evaluation process;*
- *The types of evaluation;*
- *The components of evaluation / self-evaluation;*
- *Usage of evaluation results.*

## **7. Additional Income-Generating Activities**

- *Income-generation and marketing;*
- *How to write a business plan;*
- *Legislation on income-generating activities;*

## **8. Advertising Campaign Planning**

- *General review of advertising campaign;*
- *Advertising campaign efficiency;*

- *Planning advertising campaign;*
- *Results of advertising campaign;*

#### **9. Renewable Energy Sources**

- *Solar energy overview;*
- *Wind energy short overview;*
- *Water energy short overview;*
- *Biomass energy short overview;*
- *PV application markets;*

#### **10. Renewable Energy Usage Efficiency**

- *Evaluation of concrete renewable energy resource potential;*
- *Calculation of concrete renewable energy usage efficiency;*
- *Renewable energy cost calculation;*
- *Selection of the proper source of energy for usage in specific conditions;*

#### **11. Technologies of Solar Photovoltaics**

- *Current solar photovoltaic (PV) technology overview;*
- *Types of solar PVs;*
- *PV cells, modules, array;*
- *PV system types;*
- *Detailed overview of PV system components;*
- *PV system applications;*
- *Measuring methods to obtain solar PV module current-voltage characteristics.*

### **Training Results**

After completing the training course the applicant will be able to write a complete business plan and successfully realize it.

*Beside this at the end of the training program applicant will conduct a workshop on "Possibilities of Renewable Energy usage in Georgia and its Economical Aspects".*

# Business Plan

## Description of the Project

According to the project the small enterprise of portable solar photovoltaic panels will be established under JSC “Spetsheliotbomontaji” and NGO “Sun and Earth”. At the beginning there will be produced low power PV panels from 1 to 15 watt of different size, purpose and functionality (see in Additional Information chapter). In future, approximately 1-2 years after establishing the Enterprise, there will be also added the service of collecting, completing and installing bigger stationary solar photovoltaic systems (hundred of watts). On the first stage as the basic material will be used amorphous silicon crystal modules, which are flexible, elastic, light and very practical in usage.

For the project realization purposes small enterprise area will be rented and equipped with needed devices and tools. Ten youth will be hired for manufacturing, distributing products and advertising campaign planning. They will work as volunteers for the first two-month period, after that fixed salary will be given. Manufactured products will be distributed in five shopping centers of Tbilisi and in the following regions of Georgia: Imereti, Achara, Kakheti.

This project is very important for the agitation and popularization of solar energetics in Georgia, as there will be established the first enterprise producing solar photovoltaic equipment inside the country. Also, at the first stage of the project there will be employed 12 youth and on the next stage (approximately after one year period) this number should increase three times.

Consumers (any person or firm) will be able to use PVs: in any situation - in apartments, offices, outdoors, in car etc. And for the various reasons – lighting, charging mobile phones, watching television and listening radio. Many people who live in a high mountainous and off-grid areas will ameliorate their social conditions. They will be able to charge mobile phones (which are commonly the unique communication means), to receive information by means of television and radio and fill the existing information vacuum.

The project implementation place is Georgia. The enterprise will be established in the district of Tbilisi – Digomi and the products will be sold as in Tbilisi, as well on whole territory of Georgia.

The project implementation will begin after receiving financial support, approximately in the middle of September 2003.

This project has the following main objectives:

1. Contribution to the climate change problem by production, spreading and popularization of ecologically clean power sources such as solar PV panels.
2. Employment of young people for the project realization reasons.
3. Creating new jobs for youth.

#### 4. Social and Public Benefits.

After the project realization a part of the community will understand the goodness of the usage of Renewable Energy sources such as the Sun.

#### ❖ General Timeline

#	Activity	<i>Timeline - Weeks</i> (from 15.09.03 to 15.12.03)											
		<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>	<i>V</i>	<i>VI</i>	<i>VII</i>	<i>VIII</i>	<i>IX</i>	<i>X</i>	<i>XI</i>	<i>XII</i>
<b>1.</b>	<b>Planning</b>												
1.1	General Planning												
<b>2.</b>	<b>Pre-Operations / Construction</b>												
2.1	Foundation of the enterprise												
2.2	Renting enterprise area												
2.3	Buying equipment / devices												
2.4	Buying working tools												
2.5	Buying materials												
2.6	Business Trip – Purchase of Solar Panels												
2.7	Hiring employees												
<b>3.</b>	<b>Operations</b>												
3.1	Products manufacturing												
3.2	Products distribution												
3.3	Advertising / Promotional campaign												
3.4	Situation analysis												
<b>4.</b>	<b>Future Plans</b>												
4.1	Summing up enterprise working effectiveness	<i>From 15.12.03 to 30.12.03</i>											
4.2	Composing next year working plan												

#### ❖ Expansion of General Activities

##### 1. Planning

###### 1.1. General Planning

Will be defined the exact dates of each action, such as: equipment buying, business trip, etc. Also, personality of employees, hiring date and period.

##### 2. Pre-Operations / Construction

###### 2.1. Foundation of the enterprise:

The enterprise will be founded under the NGO “Sun and Earth”, which will provide the legal status of the enterprise.

###### 2.2. Renting enterprise area:

Area where the enterprise will be founded is situated in the district of Tbilisi – Digomi: apt. 2, 6, K. Chachava str. At the beginning the area will be rented for the project implementation time period.

### 2.3. Buying equipment / devices:

The list of devices needed for the enterprise:

- Leather sewing-machine
- Laminator
- Air ventilating machinery

### 2.4. Buying working tools

The list of working tools needed for the enterprise:

- 40 piece instrument toolkit
- Solders toolkit
- Screwdriver toolkit
- Wire-cutter toolkit
- Multimeter
- Scissors toolkit
- Sewing toolkit
- Substitution parts

### 2.5. Buying materials

The list of materials needed for the enterprise:

- Special fabric for the portable PVs production
- Electrical wires for PV modules communication
- Soldering materials
- Sewing threads
- Sewing needles
- Printing paper
- Laminated plastic

### 2.6. Business Trip – Purchase of Solar Panels

The business trip will be to Moscow in order to purchase flexible solar photovoltaic modules.

### 2.7. Hiring employees

Selecting youth workers for the product manufacturing.

## 3. Operations

### 3.1. Products manufacturing

Products manufacturing will begin according to the timeline. The quantity of production in the given time period will be calculated according to the existing demand.

### 3.2. Products distribution

The products will be distributed in five shopping centers in Tbilisi and also in the regions of Georgia: Imereti (Kutaisi), Achara (Batumi), Kakheti (Telavi).

### 3.3. Advertising / Promotional campaign

The following type of advertising will start simultaneously with the distribution: street advertising and magazine advertising.

### 3.4. Situation analysis

After every step the existing situation analysis will be carried out.

## 4. Future Plans

### 4.1. Summing up enterprise working effectiveness

After finishing the activities of the timeline the existing situation will be summed up. It will be calculated how effective was the enterprise establishment and what profits will it give if continued functioning.

### 4.2. Composing next year working plan

The next year working plan and strategy will be decided and approved according to the three month working period summary.

The monitoring can be held on each step of the project realization.

The written summary will be composed after each stage.

### **Participating Organization:**

The role of JSC “Spetsheliotbomontaji” and NGO “Sun and Earth” is to help in the enterprise foundation. In fact, the enterprise will be founded under the NGO “Sun and Earth”. No additional role is assigned to the NGO.

(See detailed information about organization in the Additional Information Chapter.)

### **Expected Results**

After enterprise establishment there will be produced low power portable PV panels from 1 to 15 watt of different size, purpose and functionality (see in Additional Information chapter).

Consumers will be able to use PVs: in any situation - in the apartments, outdoors, in car, etc. And for the various reasons – lighting, charging mobile phones, watching television listening radio, etc.

After realizing the project a part of the community will understand the goodness of the usage of Renewable Energy sources such as the sun. Many people who live in a high mountainous and off-grid areas will ameliorate their social conditions. They will be able to charge mobile phones (which are commonly the unique communication means), to receive information by means of television and radio and fill the existing information vacuum.

The planned advertising campaign will promote and popularize the usage of ecologically clean solar energy. All this is very important for Georgia, because here are still many people who even have not heard about renewable sources of energy.

It will be the first enterprise in Georgia manufacturing portable PVs.

By realizing this project we shall also contribute to the global climate change and youth employment problem. Partly public and social conditions will be meliorated.

In future, approximately 1-2 years after establishing the enterprise, there will be also added the service of collecting, completing and installing bigger stationary solar photovoltaic systems (hundred of watts).

*As it will be the enterprise established under an NGO, all the incomes will be used for other renewable energy projects realization.*

*No salaries will be given to any member of the NGO.*

## Additional Information

### ❖ Enterprise Area:

The enterprise area is located on the following address:

appt. 2, 6, K. Chachava str., Tbilisi, 380059, Georgia.

The area will be rented from an private individual and it's protected by the iron grating.

### ❖ Participant Organization:

NGO "*Sun and Earth*" is nongovernmental, nonpolitical ecological union.

#### *The main purposes of the NGO are:*

- To participate in solving of the problem of mankind and environment harmonious coexistence;
- To assist usage of ecologically clean energies of sun, wind and water, in order to solve difficulties of environment defense, technical and social problems;

#### *I have participated in the following projects of NGO "Sun and Earth":*

1. "Ecologically Clean Energy for the Ecologically Clean Environment" - October - November 2000;
  2. "Solar Energy in Service of the Oil Pipeline (The ways of decreasing harmful exhausts of Baku-Supsa oil pipeline on the territory of Georgia)" - December 2000 - June 2001;
  3. "Solar Energy in Service of the Cultural Monuments" - January-October 2002;
  4. "The Ways of Transboundary Lake Jandara Ecological Amelioration" - March-August 2002;
- In these projects my role was to help in: practical installations of PVs, information spreading, bucket publishing, web-site development etc.

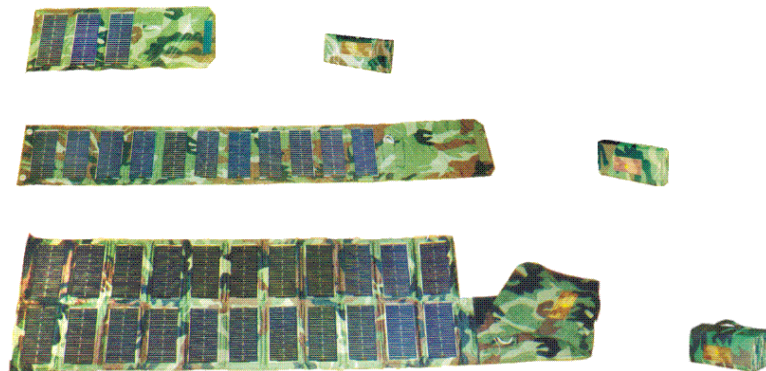
#### *Contact Information:*

Tel/Fax: +995 32 525 969

E-mail: [mze@geo.net.ge](mailto:mze@geo.net.ge)

### ❖ Production

This kind of production will be manufactured in the enterprise:



❖ Budget

1. *Enterprise Area Rent* (4 month x 100 \$) - 400 USD

2. *Equipment and materials.*

#	Title	Unit price-USD	Quantity	Sum-USD
1.	<b>Equipment / devices</b>			
1.1	Leather sewing-machine	350	1	350
1.2	Laminator	120	1	120
1.3	Air ventilating machinery	80	1	80
2.	<b>Working Tools</b>			
2.1	40 piece instrument toolkit	20	1	20
2.2	Solders toolkit	25	2	50
2.3	Screwdriver toolkit	5	2	10
2.4	Wire-cutter toolkit	10	1	10
2.5	Multimeter	20	1	20
2.6	Scissors toolkit	10	2	40
2.7	Sewing toolkit	20	1	20
2.8	Substitution parts	-	-	50
3.	<b>Materials</b>			
3.1	Solar panels	4	390w	1560
3.2	Special fabric	3	50m	150
3.3	Connection and communication wires	0.5	100m	50
3.4	Soldering materials	1.5	10pcs	15
3.5	Sewing threads	1	10	10
3.6	Sewing needles	0.5	10	5
3.7	Printing paper	5	2pack	10
3.8	Laminated plastic	10	2pack	20
<b>Total Sum</b>				<b>2590</b>

2. *Travel allowance for the regions of Georgia*

#	Title	Sum - USD
1	Car hiring (7 days x 35 \$)	245
2	Daily allowance (7 days x 15 \$)	105

Total Sum	<b>350</b>
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***3. Hired personnel labor payment.***

#	Position	Quantity	Payment - USD/month	Working period - month	Sum - USD
1.	Tailor	2	45	1	90
2.	Solderer	2	45	1	90
3.	Advertising Manager	1	50	1	250
4.	Distributor	5	40	1	400
Total Sum					<b>830</b>

***4. Advertising Campaign***

#	Title	Sum - USD
1.	Street Advertising	350
2.	Magazine Advertising	210
3.	Participating in energetics exhibition	270
Total Sum		<b>830</b>

**Total Costs of the Project:**

**5 000 USD**

# Monthly Report

Establishment of the Portable Photovoltaic Panels' Production Enterprise and Distribution Network

**Monthly Report**  
(25.11.03 – 25.12.03)

## 1. General information

<u>Name</u>	Levan Kobakhidze
<b>Co-Applicant Organizations</b>	Involved Organizations: 1. JSC "Spetsheliotbomontaji" 2. NGO "Sun and Earth"
<b>Project Start Date</b>	November, 25.
<b>Expected Completion Date</b>	end of February
<b>Project Location</b>	Georgia

## 2. Project Progress

<u>Targets Achieved</u>	<ul style="list-style-type: none"><li>- General planning has been conducted;</li><li>- Enterprise has been founded;</li><li>- Enterprise area has been rented;</li><li>- All the needed equipment / devices / working tools / materials have been purchased;</li><li>- Enterprise area has been equipped;</li><li>- Monthly report has been written.</li></ul>
<b>Change in projections (if any)</b>	No changes.
<b>Impact of achievements</b>	There exist working plan, according which fully equipped

	enterprise can begin working.
<b>Impact of Changes</b>	-
<b>Factors influencing project progress (Positive &amp; Negative)</b>	<p>Negative factors:</p> <ul style="list-style-type: none"> <li>- The price of flexible solar photovoltaic modules raised up, therefore we were constrained to pass money from exhibition expenses and has decreased the purchase quantity;</li> </ul> <p>Positive factors:</p> <ul style="list-style-type: none"> <li>- It became possible to rent bigger area for enterprise at the same specified price;</li> </ul>
<b>Problems faced (if any)</b>	There were faced no significant problems.
<b>Suggestions to overcome the problems</b>	-

### 3. Work plan for the next period

The following actions are planned for the next month period:

- Finding and Hiring employees according to experience and practical tests;
- Begin product manufacturing;
- Create and print manufactured products' exploitation instructions;
- Create advertising pamphlets;
- Distribute advertising pamphlets;
- Begin product distribution in Tbilisi;
- Write monthly report;

### 4. Supporting documents of Project Progress.

**Photos showing equipped enterprise area**



## 5. Financial Report

Income and expenses for the period 25 / 11 / 2003 - 25 / 12 / 2003

<u>Beginning Balance</u>	5000
Incomes:	
- YES Campaign, EDC Inc.	5000
Total:	5000
Expenses :	
- Enterprise Area Rent (3 months)	300
- Leather sewing-machine	350
- Printer	150
- 40 piece instrument toolkit	20
- Solders toolkit	50
- Screwdriver toolkit	10
- Wire-cutter toolkit	10
- Multimeter	20
- Scissors toolkit	40
- Sewing toolkit	20
- Substitution parts	50
- Solar panels	1910
- Special fabric	150
- Connection and communication wires	50
- Soldering materials	15
- Sewing threads	10
- Sewing needles	5
- Printing paper	30
Total:	3190
<u>Ending Balance</u>	1810

Comments on the changes in expense articles in comparison with submitted initial budget:

Article	Initial budget expense	Changed expense
---------	------------------------	-----------------

Solar panels	1560	1910
Printer	-	150
Printing paper	10	30
Laminator	120	-
Laminated plastic	10	-
Air ventilating machinery	80	-
Participating in energetics exhibition	270	-

# Monthly Report

(25.12.03 – 25.01.04)

## 1. General information

<u>Name</u>	Levan Kobakhidze
<b>Co-Applicant Organizations</b>	Involved Organizations: 1. JSC “Spetsheliotbomontaji” 2. NGO “Sun and Earth”
<b>Project Start Date</b>	November, 25.
<b>Expected Completion Date</b>	end of February
<b>Project Location</b>	Georgia

## 2. Project Progress

<b>Targets Achieved</b>	<ul style="list-style-type: none"><li>• Working staff has been collected;</li><li>• Product manufacturing has been started;</li><li>• Product’s exploitation instructions has been designed and printed;</li><li>• Advertising pamphlets has been designed and printed;</li><li>• Product distribution has been started in Tbilisi;</li><li>• Advertising campaign has been started;</li><li>• Monthly report has been written;</li></ul>
<b>Change in projections (if any)</b>	It was decided to pass magazine advertising expenses on street advertising and increase number of printed pamphlets.
<b>Impact of achievements</b>	<ul style="list-style-type: none"><li>• Products’ first exemplars have been sold and the first income was received;</li><li>• A part of community understood goodness of solar energy usage;</li></ul>
<b>Impact of Changes</b>	-
<b>Factors influencing project progress (Positive &amp; Negative)</b>	There were no significant factors influencing project.

Problems faced (if any)	There were faced no significant problems.
Suggestions to overcome the problems	-

### 3. Work plan for the next period

The following actions are planned for the next month period:

- Continue product manufacturing;
- Continue advertising campaign;
- Continue product distribution in Tbilisi;
- Begin product distribution in Telavi, Kutaisi and Batumi;
- At the end of the month begin situation analysis;
- Write monthly report;

### 4. Supporting documents of Project Progress.

#### Working day in the enterprise



Products' advertising pamphlets

**სწახლექ!** **პირველად  
საქართველოში!**

დასაკეც-გადასატანი ელასტიური  
მზის ბატარეები  
მობილურის დასამუხტად!

**მსუბუქი! კომპაქტური! დრეკადი!**



**პარამეტრები:**  
ძაბვა - 4.5 V  
დამუხტვის დენი - 400 mA  
მასა - 180 გრ.  
ზომა: 180X85X8  
მუშაობის ხანგრძლივობა 10 წელი.

**ტელ/ფაქსი: 525 969 მობ: 899 277 533**

დამზადებულია ამერიკული  
ტექნოლოგიით  
YES-ის პროექტის ფარგლებში



## 5. Financial Report

Income and expenses for the period 25 / 12 / 2003 - 25 / 01 / 2004

<u>Beginning Balance</u>	1810
Incomes:	
Sold products:	
- 3 solar panels for mobile phone charging	120
- one 21 watt portable solar panel	330
Total:	2260
Expenses :	
- Street Advertising	310
- Product distribution in Tbilisi	40
Total:	350
<u>Ending Balance</u>	1910

Comments on the changes in expense articles in comparison with submitted initial budget:

Article	Initial budget expense	Changed expense
Magazine advertising	210	-
Street Advertising	350	560

According to the advertising manager decision money from magazine advertising was passed on street advertising.

## Monthly Report

(25.01.04 – 25.02.04)

### 1. General information

<u>Name</u>	Levan Kobakhidze
<b>Co-Applicant Organizations</b>	Involved Organizations: 1. JSC “Spetsheliotbomontaji” 2. NGO “Sun and Earth”
<b>Project Start Date</b>	November, 25.
<b>Expected Completion Date</b>	February, 25.
<b>Project Location</b>	Georgia

### 2. Project Progress

<u>Targets Achieved</u>	<ul style="list-style-type: none"><li>• Product manufacturing has been continued;</li><li>• Product’s exploitation instructions has been printed;</li><li>• Advertising pamphlets has printed;</li><li>• Product distribution has been continued in Tbilisi;</li><li>• Product distribution has been started in Telavi, Kutaisi and Batumi;</li><li>• Advertising campaign has been continued;</li><li>• Monthly report has been written;</li><li>• Situation analysis has been started;</li></ul>
<b>Change in projections (if any)</b>	<ul style="list-style-type: none"><li>• Additional materials have been purchased;</li><li>• Time for situation analysis was increased;</li></ul>
<b>Impact of achievements</b>	<ul style="list-style-type: none"><li>• We made a contribution to the global climate change an youth employment problem;</li><li>• Partly public and social conditions has been meliorated;</li></ul>
<b>Impact of Changes</b>	Additional materials have been purchased for the enterprise future work.
<b>Factors influencing project progress (Positive &amp; Negative)</b>	There were no significant factors influencing project.

Problems faced (if any)	There were faced no significant problems.
Suggestions to overcome the problems	-

### 3. Work plan for the next period

According to results of situation analysis it is planned to compose one year working plan.

### 4. Supporting documents of Project Progress.

New English Language advertising pamphlets have been created.

**PORTABLE! FOLDABLE! FLEXIBLE! SOLAR PANELS**

**NEW!**

- ✓ Durable
- ✓ No Glass
- ✓ Lightweight
- ✓ Any Weather
- ✓ Shadow Tolerant

Product	Power	Volts	Amps	Weight, kg
FleX 7	7,5	15	0,5	0,6
FleX 15	15	15	1	1,2
FleX 20	21	15	1,3	0,9
FleX 30	32	15	2	1,3

For additional information please contact: [levi@gol.ge](mailto:levi@gol.ge)

Made in Georgia  
with American Technology  
Supported by YES and The World Bank

## 5. Financial Report

Income and expenses for the period 25 / 12 / 2003 - 25 / 01 / 2004

<u>Beginning Balance</u>	1910
Incomes:	
Sold products:	
- 4 solar panels for mobile phone charging	160
- two 21 watt portable solar panel	660
- one 32 watt portable solar panel	495
Total:	3225
Expenses :	
- Enterprise Area Rent (3 months)	300
- Labor payment (salaries)	430
- Travel allowance for the regions	270
- Street Advertising	250
- Product distribution in Tbilisi	40
- Product distribution in Telavi, Kutaisi and Batumi	270
- Solar panels (105 watt)	680
- Special fabric	50
- Connection and communication wires	15
- Soldering materials	5
- Printer cartridges	65
- Printing paper	15
Total:	2390
<u>Ending Balance</u>	835

Comments on the changes in expense articles in comparison with submitted initial budget:

**No Change.**

# Final Report

## *Establishment of the Portable Photovoltaic Panels' Production Enterprise and Distribution Network*

### 1. General Information:

<b>Name:</b>	Levan Kobakhidze
<b>Co-applicants</b>	Involved Organizations: 1. JSC "Spetsheliotbomontaji" 2. NGO "Sun and Earth"
<b>Project Timeframe</b>	25. 11.03 – 25.02.04

### 2. Rollout Plan:

Month	Day	Action
December	25.11 – 2	General planning has been conducted
	2	Enterprise has been founded
	3	Enterprise area has been rented
	4 – 16	All the needed equipment / devices / working tools / materials have been purchased
	4 – 24	Enterprise area has been equipped
	25	Monthly report has been written
January	26 – 8	Working staff has been collected
	5	Product manufacturing has been started
	10 – 14	Product's exploitation instructions has been designed
	14	Printing of product's exploitation instructions has been started
	10 – 15	Advertising pamphlets has been designed
	15	Printing of has advertising pamphlets been started
	15	Product distribution has been started in Tbilisi
	15	Advertising campaign has been started
	25	Monthly report has been written
February	2	Product distribution has been started in Telavi, Kutaisi and Batumi
	25	Monthly report has been written
	28	Situation analysis has been started

### 3. Project Budget

- (i) Please indicate budget articles proposed in the Application Form submitted to the YES and compare with the actual expenses in the following form:

No.	Items	Planned Budget	Actual Budget	Difference	Planned quantity	Actual quantity	Difference	Number of receipt or other attached document
1	Enterprise area Rent	800	800	0	-	-	-	
<b><i>Equipment and materials</i></b>								
2.1.1	Leather sewing-machine	350	350	0	1	1	0	
2.1.2	Laminator	120	0	120	1	0	1	
2.1.3	Air ventilating machinery	80	0	80	1	0	1	
2.2.1	40 piece instrument toolkit	20	20	0	1	1	0	
2.2.2	Solders toolkit	50	50	0	2	2	0	
2.2.3	Screwdriver toolkit	10	10	0	2	2	0	
2.2.4	Wire-cutter toolkit	10	10	0	1	1	0	
2.2.5	Multimeter	20	20	0	1	1	0	
2.2.6	Scissors toolkit	40	40	0	2	2	0	
2.2.7	Sewing toolkit	20	20	0	1	1	0	
2.2.8	Substitution parts	50	50	0	-	-	-	
2.3.1	Solar panels	1560	1910	350	390w	303w	-87w	
2.3.2	Special fabric	150	150	0	50m	50m	0	
2.3.3	Connection and communication wires	50	50	0	100m	100m	0	
2.3.4	Soldering materials	15	15	0	10pcs	10pcs	0	
2.3.5	Sewing threads	10	10	0	10	10	0	
2.3.6	Sewing needles	5	5	0	10	10	0	
2.3.7	Printing paper	10	30	20	2pack	3pack	1	
2.3.8	Laminated plastic	20	0	20	2pack	0	2	
<b><i>Travel allowance for the regions of Georgia</i></b>								
3.1	Car hiring (7 days)	245	245	0	-	-	-	
3.2	Daily allowance (7 days)	105	105	0	-	-	-	
<b><i>Hired personnel labor payment</i></b>								
4.1	Tailor	90	90	0	-	-	-	
4.2	Solderer	90	90	0	-	-	-	
4.3	Advertising Manager	50	50	0	-	-	-	
4.4	Distributor	200	200	0	-	-	-	
<b><i>Advertising Campaign</i></b>								
5.1	Street Advertising	350	560	210	-	-	-	
5.2	Magazine Advertising	210	0	210	-	-	-	
5.3	Participating in energetics exhibition	270	0	270	-	-	-	

<i>Items not listed in initial budget</i>								
1	Printer	-	150	-	-	1	-	

(ii) Please mention the expenses in chronological order.

**4. Achievements and status :**

(In case of procurement of equipment, renovation or construction of premises, indicate their present usage)

Nowadays the enterprise is producing low power portative PV panels from 2 to 32 watt of different size, purpose and functionality. After realizing the project a part of the community understood the goodness of usage of Renewable Energy sources such as the sun. More then 10 Young workers have been employed.

People who live in high mountainous and off-grid areas and has purchased our product ameliorated their social conditions. Now they are able to charge mobile phones (which are commonly the unique communication means), to receive information by means of television and radio and fill the existing information vacuum.

The advertising campaign is promoting and popularizing usage of ecologically clean solar energy.

It is the first enterprise in Georgia manufacturing portable PVs.

By realizing this project we have also contributed to the global climate change and youth employment problem. Partly public and social conditions have meliorated.

Currently the enterprise is continuing work, with already purchased equipment, devices and working tools. In future it is planed to increase products' manufacturing and add very ample range of services, such as: Solar photovoltaic station projection and installations, consulting, etc.

Supporting documents e.g., photos etc. related to the project.

**Photos showing equipped enterprise area**



**Working day in the enterprise**



Products' advertising pamphlets

**სამახალაო!** პირველად საქართველოში!

დასაკეც-გადასატანი ელასტიური მზის ბატარეები მობილურის დასამუხტად!

**მსუბუქი! კომპაქტური! დრეკადი!**



**პარამეტრები:**  
 ძაბვა - 4.5 V  
 დამუხტვის დენი - 400 mA  
 მასა - 180 გრ.  
 ზომა: 180X85X8  
 მუშაობის ხანგრძლივობა 10 წელი.

ტელ/ფაქსი: 525 969 მობ: 899 277 533

დამზადებულია ამერიკული ტექნოლოგიით  
 YES-ის პროექტის ფარგლებში



**NEW!** PORTABLE! FOLDABLE! FLEXIBLE! SOLAR PANELS

- ✓ Durable
- ✓ No Glass
- ✓ Lightweight
- ✓ Any Weather
- ✓ Shadow Tolerant




Product	Power	Volts	Amps	Weight, kg
FleX 7	7,5	15	0,5	0,6
FleX 15	15	15	1	1,2
FleX 20	21	15	1,3	0,9
FleX 30	32	15	2	1,3

For additional information please contact: [levi@gol.ge](mailto:levi@gol.ge)

Made in Georgia  
 with American Technology  
 Supported by YES and The World Bank




(Date)  
 (Signature)

# Final Evaluation

## EVALUATION REPORT OF THE YES RENEWABLE ENERGY FELLOW LEVAN KHOBAKHIDZE, GEORGIA By Dr. Nugzar Meladze

### Introduction

Mr. Levan Khobakhidze is a very enthusiastic young leader from Georgia. He's main work is renewable energy development. In a past few years he participated at the several projects on renewable energy:

1. "Ecologically Clean Energy for the Ecologically Clean Environment", 2000
2. "Solar Energy in Service of the Oil Pipeline (The ways of decreasing harmful exhausts of Baku-Supsa oil pipeline on the territory of Georgia)", 2001
3. "Solar Energy in Service of the Cultural Monuments" - 2002;
4. "The Ways of Transboundary Lake Jandara Ecological Amelioration" - 2002;

Beside these he individually implemented the following projects:

1. "The Working Model of the Tracking Solar Photovoltaic Station"
2. "The Ways for Decreasing the Solar Photo-energy Cost"

He is one of the five successful Renewable Energy Fellowship winners of the Youth Employment Summit (YES) campaign. After successfully participating in a 3 months training on Renewable Energy at the "Green Earth", "Sun and Earth" and JSC "Spetsheliotmonontaji", Levan presented a business plan on the establishment portable photovoltaic panels production enterprise and distribution network.

Project Background: Energy Situation in Georgia

### Country Background Information

#### Geography

Area: 70,000 sq. km;

Cities: Capital - Tbilisi (population 1.5 million -1996)

Terrain: Mostly rugged and mountainous

Climate: Generally moderate; mild on the Black Sea coast with cold winters in the mountains.

#### People

Nationality: Noun and adjective-Georgian(s).

Population: 5.5 million.

Population growth rate: -1.02%

Ethnic groups: Georgian 77.1%, Armenian 7.1%, Russian 4.5%, Azerbaijan 5.5%, Ossetian 2%, Abkhaz 1%, other 2.8%.

**Religion**

Georgian Orthodox 70%, Muslim 10%, Russian Orthodox 7%, Armenian Apostolic 7%, 6%-other.

**Language**

Georgian (official)

**Education**

Year's compulsory- 12 (starts from year 2000). Literacy - 99%.

**Government**

Type: Republic.

Constitutional update: October 17, 1995. First Constitution- February 21st of 1921

Branches: Executive - President with State Chancellery. Legislative - Unicameral Parliament: 232 members. Judicial - Supreme Court, Prosecutor General and local Courts, Constitutional Court.

Subdivisions: 63 districts, including those within the two Autonomous Republics (Abkhazia and Ajaria).

Political parties: Citizens Union of Georgia, National Democratic Party, United Republican Party, Georgian Popular Front, Georgian Social Democratic Party, All Georgia Revival Union, Greens Party, Agrarian Party, Georgia Socialist Party and others.

Suffrage: Universal over 18.

Georgia is an independent, unified and indivisible law base state, ratified by the referendum carried out on March 31, 1991 throughout the territory of the country.

Georgia is located in wrinkled Alpine zone, in Subtropical zones of northern periphery. Georgia differs by its contrast relief. It is represented by high, middle and low mountainous highland plane unity. The Caucasus is reflected sharply, inter mountain lowland. Georgia is rich by minerals resources: oil, coal, peat, iron, magnum, copper, projectile-zinc, arsenic, mercury, andezit, barite, talc, serpentit, agate, quartz, basalt, granite, diorite, marble, etc.

The development of society along with other factors is based on how well informed young people are of their opportunities, duties and rights in planning and building for the future. Young people are distinguished by their more progressive views on issues; this comes from their intellectual potential and their ability to sympathize.

Negative factors in society have a particular affect on society. Urbanization, family crises, an increase in the pace of life, a difficult economic situation, an escalation in ethnic conflicts and alienation of youth in society have a particular affect on youth, around whom there appears the danger of pathogenic and criminal situations because of the lack of both firm recognition and a psychological culture.

Among the numerous problems facing our society the results of the social vulnerability of our future generation is one of the most threatening ones. The potential of youth should be applied to the maximum; the implementation of programs and schemes is conditioned by the economic, social and political participation of youth.

## Overview Of Economy

The first years of independence of Georgia were very difficult. The traditional economic ties were disrupted and the markets were lost. The state agencies (central bank, tax and customs administrations, others) necessary for an independent country, relevant legislative framework of market economy, and monetary and fiscal mechanisms of regulation were non-existent. Internal political controversy, civil wars and a high number of refugees making it practically impossible to manage the economic and political processes on a consistent and systemic basis aggravated the situation further. 1992-1995 were the years of a deep depression for Georgian economy. In 1995 the stage of political stabilization gradually starts in the country. Strengthening of central authority and enhancing of criminal situation had a positive effect on the economy.

In consultation with international financial institutions, the Government of Georgia devised an anti-crisis program aiming to overcome the difficult socio-economic situation. The implementation of this program was commenced from February 1994. The implemented measures had a positive outcome for the country.

It is noteworthy, that recent global processes taking place in the world had a positive impact on the stabilization process in the country, thus distinguishing the international function of the Caucasus Region and Georgia, in particular. Increased interest of the western countries in development of trade relations with the countries of Central Asia and Caucasus seeking for alternative routes of transportation of energy carriers and energy safety has resulted in acknowledging Georgia as a country of junction connecting Europe and Asia.

The Government of Georgia is fully conscious that multilateral phenomenon of poverty can not be surmounted unless sustainable economic development is ensured in the country, which will be based on deepening of economic and institutional reform and substantial reduction of corruption. Thus, the given Document captures and analyzes macroeconomic environment in the country, status of implementation of the economic reforms, social conditions of the population, especially of the poor, as well as intersectional and systemic problems of the Government and people of Georgia.

Macroeconomic analysis demonstrates that during the recent years government of Georgia has successfully discharged one of the most important economic functions of the country – it ensured price stability and moderate inflation rates. Thus, comparative stability of the macroeconomic environment is a significant achievement of the economic policy of the Government of Georgia. However, fast and sustainable economic growth and substantial improvement of social condition of the population should be attained.

The Georgian government is committed to economic reform in cooperation with the IMF and World Bank, and stakes much of its future on the revival of the ancient Silk Road - as the Eurasian Corridor, using Georgia's geography as a bridge for transit of goods between Europe and Asia.

The foreign economic policy, implemented by the Government has had a positive influence over the growth of the economy at large. The government of Georgia has been carrying out significant activities aimed at achieving its integration into the international markets. Georgia has become a participant of international business regulations by becoming a member of the

World Trade Organization. Given the limited local market, this should considerably facilitate investments in the export producing sectors of Georgia.

### **Unemployment Rate**

According to United Nations estimates, over one billion young women and men live in the world today. This means that approximately one person in five is between the ages of 15 and 24 years, and that youth comprise 18 per cent of the world's population.

Unemployment creates a wide range of social ills, and young people are particularly susceptible to its damaging effects: the lack of skills, low self-esteem, marginalization, impoverishment and the wasting of an enormous human resource.

The unemployment problem of youth is further compounded by decreasing productivity of the labor force.

Unemployment and underemployment among youth is a problem everywhere, and is part of the larger struggle to create employment opportunities for all citizens. The difficulty of finding suitable employment is compounded by a host of other problems confronting young people, including illiteracy and insufficient training, and is worsened by periods of world economic slow-down and overall changing trends.

The mean annual quantity of employees in 1997 grew by 9.7% and by draft estimation consisted 2233.2 thousand inhabitants. 75% from them is employed by non-governmental sector, 25% by governmental. Almost two third of employees are self-employee. About 80% of self-employees are working in agriculture. By the working hours self-employees generally have worked 1.4 less hours than living labor force. Nevertheless their average income estimated on one working hour, was twice much than income of hiring employees. (A PROFILE OF THE LABOUR MARKET IN GEORGIA)

In 1997 compared to previous year, number of unemployed citizens declined almost twice and by the draft estimation consisted 138 thousand persons. According to International Labor Organization Standards, unemployment rate in Georgia consisted 5.8%. It takes into account less strong criteria (number of unemployed, with no hope to find any job) this index is higher - 10.4%.

### **YES RE Fellowship Program**

Levan Khobakhidze as a YES RE Fellow fill special application forms, where he's co-applicant organizations were: NGO "Green Earth", "Sun and Earth", YES Georgia and JSC "Spetsheliotbomontaji". These organizations had at minimum 6 years work experience in various projects on renewable energy.

The first stage of the fellowship program was 3 month training. The training program was in the following subjects:

<i>Strategic Planning</i>
---------------------------

<i>Financial Management</i>
-----------------------------

<i>Human Resource Management</i>
<i>Marketing Management</i>
<i>Internal / Organization Management</i>
<i>Program Evaluation / Self-Evaluation</i>
<i>Additional Income-Generating Activities</i>
<i>Advertising Campaign Planning</i>
<i>Renewable Energy Sources</i>
<i>Renewable Energy Usage Efficiency</i>
<i>Renewable Energy Technologies</i>

At the end of the training together with co-applicant organizations was organized two day workshop on renewable energy, YES Seed grant project and YES HQ activities dissemination. The workshop was very succesfull and many young people participated.

After completed training program Levan Khobakhidze prepared business plan with budget of 5000 USD and YES HQ funds for implementing. The name of the project was: Establishment of the Portable Photovoltaic Panels' Production Enterprise and Distribution Network.

The action which was done through the project:

Established enterprise to produce solar portable PV in Tbilisi (Georgia)

The necessary equipments have been purchased

Opened new jobs for 15 young people from area

Product manufacturing has been started

Advertising booklets, pamphlets and exploitation has been produced

Organized advertising campaign

Product distribution has been started in Telavi, Kutaisi and Batumi

Prepare situation analyses