

Project Title: 45 Solar Electricity Generating Panels for Tsanak Tibetan Village

Project Location:

Village	Township	County	Prefecture	Province
查纳亥 Tsanak	过马营 Gomang	贵南 Guinan	海南 Hainan	青海 Qinghai
ཅན་མེ	གམ་མཚོ	ཁུན་པོ	ཧཱེ་ནཱེ	འབྲུག་ཡུལ་

IMPLEMENTING ORGANIZATION:

Name: Friendship Charity Association (FCA)

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TARGETING TO:

- Basic Literacy [] Basic Healthcare [
- Gender Equality/Justice [] Poverty Alleviation [
- Cultural Preservation [] Rural Development [
- Community Development [] Individual Empowerment [
- Environmental Protection [] Sustainable Development [

PROJECT PURPOSE/GOAL

This Solar electricity generating panel project would provide a reliable source of electricity for Tsanak Tibetan villagers and solve problems as follows:

- Local villagers, especially the local women and girls, have to complete loads of daily chores, such as collecting fuel from the grasslands, which is five to six kilometers away from the village. This fuel is used as the source of light at night as well as for cooking. Also, they take trips to the local town 11 km away to buy oil and lamps for their night lighting. It is traditionally women's responsibility to collect fuel and buy lamps to light their tents. Consequently, a large proportion of their energy and time were occupied by these tasks.
- For years, the villagers have lived in their smoky houses and tents. As a result, their health deteriorates with eye problems and respiratory problems. In addition, cleaning smoke stained walls is also a headache for the household
- The local students have difficulty in doing their homework at night. During the day, the students need to help their parents with chores, often leaving little time for studying. Consequently, local children tend to perform poorly at school.
- The villagers take large sacks to collect fuel. Dragging these sacks for five or six kilometers damages the grassland.

- It is very difficult to travel to obtain fuel during snowy winters and rainy summers.

Villagers lack electricity and therefore cannot benefit from access to information channels like radio.

COMMUNITY BACKGROUND

There are approximately 1,746 people (378 households) with 32,400 heads of livestock live on 109,369 *mu* of grassland in Tsanak Tibetan Village. The households are situated separately on the grassland. It is about a half kilometer from one home to another. The villagers buy flour in the local town and make their living from livestock. The main livestock are sheep, goats, yaks, donkeys, and horses. They earn income mainly by selling sheep, horses and goat wool, and collecting caterpillar fungus. Approximately each person can save 600 RMB per year. After buying flour for the family and clothing, many villagers cannot afford other necessities and many go into debt.

Villagers' daily work includes collecting fuel from the grassland and herding the livestock. Villagers are currently illuminating their tents and houses by burning fuel in adobe stoves and with lamps. With the seasonal snow and rain, herding livestock and collecting fuel becomes difficult. The majority of school-aged children in Tsanak Tibetan Village are not going to school because they must contribute a lot of labor for the household. Presently, ninety-eight percent of the villagers are either very poorly educated or illiterate.

The solar electricity generating panel project would alleviate the above problems; especially the literacy rate will increase.

PROJECT EXPECTED RESULT & ACTIVITY

Project Objective	Activity: 2009 April	Output / Outcome
Reduce household expenses on fuel and lighting	Write a proposal	Monthly expenses for fuels (candles, lamps, diesel oil, and torch etc.) would be reduced by the solar panel.
Reduce over 400 villagers' labor time, allowing them to pursue other opportunities.	Hold a meeting and select recipients.	Reduction of 4 or 5 hours per day in collecting dung from grasslands 3-4km away, a maximum of 40 trips to the local town for buying lighting materials each year.
Increase students' literacy.	Collect contribution.	Reduction of school children's time on collecting fuels on a daily basis.
Provide a secure and better	Purchase solar	Alleviation of women's

life for local woman and elder people.	panels from Gesang Solar Energy Company Limited in Xining.	smoke inhalation in smoky kitchen.
Prevent villagers from depleting natural resources and polluting the environment.	Train recipients in solar panel use and simple repair.	Reduction of grassland degradation from dragging sacks for fuel.
Smoke in the households will be reduced, leading to improved health conditions	Inform recipients where repairs can be made.	Replacement of blackening smoke by the solar generating panels.
Provide a sustainable source of clear light at night	Distribute solar panels. A follow-up evaluation is made.	Local women would cook under a clear light and suffocating from smoke will be diminished.
Provide access to information and entertainment	Final report is composed.	Villagers would listen to the radios, outside news will be heard.

SUSTAINABILITY

The Solar Electricity Panels will last at least fifteen years. The company guarantees the maintenance period/warranty time for 2 years . The local village leaders and FCA will be responsible for contacting the solar panel company if any of the panels got problem during the warranty time. After the warranty time, the villagers will be responsible for buying components to repair Solar Panels by themselves. The villagers can buy those components in the county town. The villagers are providing a considerable local contribution (of 100 RMB each) when compared with their yearly cash income. In addition, the solar panels that they receive will be of high quality. Both of these factors ensure that the villagers will greatly value their solar panels and cherish them.

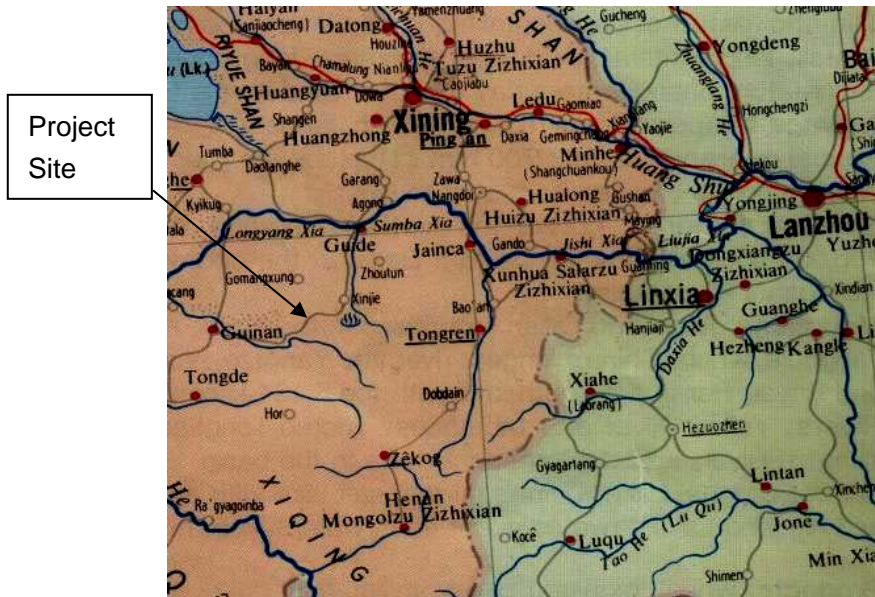
BENEFICIARIES

Type	Direct Beneficiaries
	Estimated
<u>TOTAL</u>	400
Male	180
Female	220
Girls	94
Boys	85
Minorities	400 Tibetans
Other (e.g. Elderly, disabled, etc.)	11 elderly people 3 disabled people

BUDGET

Total Program Budget (RMB)	Donor's Contribution (RMB)	Local Contribution Budget (RMB)
Solar Electricity Generating Panels	(40 Solar Panels X 800RMB) 32,000	(5 Solar Panels X 800RMB) 4,000
Transportation	0	500.00
TOTAL	32,000	4,500.00

SITEMAP



PHOTOS



A local village family's blackened ceiling & Adobe stove and fuels.

ADDITIONAL INFORMATION

1) Solar Panel

1. Technical specifications:

The panel package includes two 9w bulbs, a 3-meter and 5-meter electric lines for the bulbs, a 18w solar panel, 7 meters of electric cable, a 25AH solar battery, 6 fuses, and a manual book.

2. Manufacture Contact Info:

Company Name: Qinghai Xining Gesang Solar Energy Co., LTD
青海西宁格桑太阳能有限公司

General Manager: Nyima (尼玛),

Phone: 139 0971 7935 / 0971-3887187

Address: 西宁市国家级经济技术开发区民和路 33 号

Manufacturer: 卓玛 (Zhuoma).

Solar Panel Brand: 鸥赛 (Ou sai).

Websites: <http://www.gesangsolar.com/> <http://www.xngstyn.cn>

3. Why did we choose this supplier?

Because:

- The quality of this solar panel is very high; many past solar panel project managers and other buyers purchased solar panels from this company and the nomads are satisfied with the quality of these solar panels. Moreover, I did a solar panel project in 2006 and bought 40 solar panels from this company. During my 2009 New Year visit to some of the recipients, they said, the quality of solar panels is excellent.
- This company offers reasonable prices: 800RMB per solar panel (including battery, bulbs, and so on) for this proposed project. The prices at this company range from 500RMB to 5000RMB. The 800RMB/a solar panel is reasonable since it doesn't have as many functions as like showing TV, which is expensive. And it lasts from 7-8 hours after full charge, which is proper for the locals at night.
- Ten-year warranty—if the solar panels malfunction, the company will repair them for up to ten years after purchase.

4. How many hours of sunshine normally does this village receive?

Averagely, locals receive sunshine for 9 hours a day. Sometimes there is cloudy and rainy weather but it lasts two days at most.

5. The latitude and longitude of the local county:

1) geo: lat=35° 35'14.90" N geo: 2) long=-100° 44' 46. 85" E

6. Power generation:

The fully charged battery of electricity last 7-8 hours of normal use and can be recharged in a half day. It can be used for light (two 9w bulbs) at night, radios, and charging small batteries, such as rechargeable flashlight batteries.

7. Solar panel distribution:

There will be a meeting regarding this project with the local villagers and committee once the project is funded. Through this meeting, the poorest families that have the most children will be selected as recipients. Many other families don't have solar panel. The proposal was originally written on an estimated number (45 households) of poorest families from the village, so it was assumed the others could afford to get solar panel on their own expense. Another reason is most donors don't fund large-budget proposals, so the budget and number of recipient had to keep reasonably small.

8. Solar panel maintenance:

The solar panel has a metal package that keeps it safe when moving. Besides, the nomads are skilled at packing things safely on animals and in tractors.

2) Survey

1. Solar Panel Project Survey

Date: October 7, 2008 **Interviewer:** དབུ་ལོ། **Place:** Tsanak Tibetan Village.

1. How many people are there in your family?

Name	Sex	Age
(a) དབུ་ལོ།	male	37
(b) རོ་མཚོ།	female	28
(c) མཁར་མོ།	female	35
(d) དབང་རྒྱལ།	male	39
(e) མགོན་པོ།	male	9
(f) བད་མ།	male	27

2. Annual family cash income? 7,000RMB by herding

3. How do you make lighting? Candles, burning fuel, and butter lamps.

4. What are your annual expenses for lighting? 584RMB for lighting materials

5. What do you buy for lighting? Candles, batteries, diesel oil.

Item	Amount Used in 1 Year	Yearly Cost RMB
(a) candles	150	300
(b) diesel oil	12kg	48
(c) torch	108 batteries	236
(d) yak dung	These items do no cost anything, but they are time-consuming to gather. Furthermore, butter currently used as a fuel could be sold, increasing a family's disposable income, or eaten, improving the local diet.	
(e) butter lamp		
(f) wood		

- 6. What lighting material do you use that you don't pay?** We use yak dung, wood, and butter lamps.
- 7. How do you get that lighting material that you don't pay?** Tell me about the time it takes, who gets it and so on? My family's young people go to the grassland to collect dung, which is 3-5 kilometers away. Older women stay at home and do housework while the young ones are gone.
- 8. Where do you buy lighting materials?** At the local town
- 9. Who goes to buy these materials?** Mostly I go there for the lighting materials; sometimes my wife goes.
- 10. How often do you go there to buy lighting materials in one year?**
Approximately 24 times a year
- 11. How long it takes to go to the place that you buy lighting material and come back home?** It takes one hour by motorbike.
- 12. Do you think there any health problems with the lighting materials that you use now?** Yes, older women and men in the family get eye disease and lung problems. Also it stains the house walls and we use a lot of time to clean them.
- 13. What is your opinion of solar electricity generating panels?** I think it's a great thing for herders like us; it can light the house and tent at night without having health risks.
- 14. Have you seen solar panels before? Where? When?** Yes I have saw some this year at the local county town.

2. Solar Panel Project Survey

Date: October 7, 2008 **Interviewer:** གསང་བདག **Place:** Tsanak Tibetan Village.

1. How many people are there in your family?

Name	Sex	Age
(a) གསང་བདག	male	37
(b) བཞོ།	male	28
(c) ཟླ་མཚོ།	male	35

(d) ལྷ་མོ་བྱམས།	female	39
(e) འབྲུམ་པ་བྱམས།	male	9
(f) མཚོ་རྒྱུད།	female	27

2. **Annual family cash income?** 6,500RMB by herding
3. **How do you make lighting?** Candles, burning fuels, and butter lamps.
4. **What are your annual expenses for lighting?** 584RMB for the lighting materials
5. **What do you buy for lighting?** Candles, batteries, diesel oil.

Item	Amount Used in 1 Year	Yearly Cost RMB
(a) candles	160	320
(b) diesel oil	12kg	48
(c) torch	70 batteries	140
(d) yak dung	as above	
(e) butter lamp		
(f) wood		

6. **What lighting material do you use that you don't pay?** We use yak dung, wood, and butter lamps.
7. **How do you get that lighting material that you don't pay?** Tell me about the time it takes, who gets it and so on? We get the fuels by tractor from distant grasslands, which takes about three or four hours to go and get back. I usually take my brother and wife to get fuel.
8. **Where do you buy lighting materials?** The local town
9. **Who goes to buy these materials?** Mostly I go there for the lighting materials.
10. **How often do you go there to buy lighting materials in one year?**
Approximately 45 times a year
11. **How long it takes to go to the place that you buy lighting material and come back home?** It takes three hours by walking.
12. **Do you think there any health problems with the lighting materials that you use now?** Yes, every morning we have a sore throat when we get up, it's really painful. This is caused by smoke from candles and burning fuel in the adobe stove.
13. **What is your opinion of solar electricity generating panels?** It's a wonderful thing that can light up the tents and houses at night. If we had one, my family's amount of housework would be diminished.
14. **Have you seen solar panels before? Where? When?** Yes I have one in a rich home in the local village.

3. Solar Panel Project Survey

Date: October 8, 2008 **Interviewer:** ལྷག་ཐར་རྒྱལ། **Place:** Tsanak Tibetan Village.

1. How many people are there in your family?

Name	Sex	Age
(a) ལྷག་ཐར་རྒྱལ།	male	49
(b) མཁའ་འཛིན།	female	45
(c) ཚེ་ལོ།	male	24
(d) རྩོ་ལྷ།	male	18
(e) ཏ་འགྲིབ་རྩོ་རྩེ།	male	26
(f) ལྷ་འཛིན་ལྷ།	female	10

- 2. Annual family cash income?** 3,500RMB by herding
3. How do you make lighting? Candles, burning fuel, and butter lamps.
4. What are your annual expenses for lighting? 272RMB for lighting materials
5. What do you buy for lighting? Candles, batteries, diesel oil.

Item	Amount Used in 1 Year	Yearly Cost RMB
(a) candles	160	160
(b) diesel oil	8kg	32
(c) torch	40 batteries	80
(d) yak dung	as above	
(e) butter lamp		
(f) wood		

- 6. What lighting material do you use that you don't pay?** We use yak dung, wood, and butter lamps.
7. How do you get that lighting material that you don't pay? Tell me about the time it takes, who gets it and so on? We get the fuels by donkey with sacks. Sometimes we carry the fuels ourselves. It takes about a whole morning and all the family members go there to collect.
8. Where do you buy lighting materials? At the local town
9. Who goes to buy these materials? My son and daughter go there for the lighting materials.
10. How often do you go there to buy lighting materials in one year? Approximately 30 times in a year
11. How long it takes to go to the place that you buy lighting material and come back home? It takes about four hours by walking.
12. Do you think there any health problems with the lighting materials that you

use now? Yes, usually we get inhalation problems and get sore eyes in the smoky tent. Every morning our nostrils are blackened with the candle fuel's smoke.

13. What is your opinion of solar electricity generating panels? My opinion is it's a great thing for us but we can't afford it. If we have it the family housework would be much easier.

14. Have you seen solar panels before? Where? When? Yes I have seen it at the local county town last year.

4. Solar Panel Project Survey

Date: October 8, 2008 **Interviewer:** ལྷ་བྱམས་ཀྱུལ། **Place:** Tsanak Tibetan Village.

1. How many people are there in your family?

Name	Sex	Age
(a) ལྷ་བྱམས་ཀྱུལ།	male	46
(b) བཀྲ་མཚོ།	female	36
(c) ལྷག་མོ།	female	20
(d) ལྷག་ལྷུག་ལྷ།	male	21
(e) གཡུ་མཚོ།	female	15

2. Annual family cash income? 3,800RMB by herding

3. How do you make lighting? Candles, burning fuels, and butter lamps.

4. What are your annual expenses for lighting? 210RMB for lighting materials

5. What do you buy for lighting? Candles, batteries, diesel oil.

Item	Amount Used in 1 Year	Yearly Cost RMB
(a) candles	70	140
(b) diesel oil	10 kg	40
(c) torch	15 batteries	30
(d) yak dung	as above	
(e) butter lamp		
(f) wood		

6. What lighting material do you use that you don't pay? We use yak dung, wood, and butter lamps.

7. How do you get that lighting material that you don't pay? Tell me about the time it takes, who gets it and so on? We get it by cart pulled by my people in my family; mostly the younger go there with the cart. It takes about four or

five hours.

8. **Where do you buy lighting materials?** At the local town.
9. **Who goes to buy these materials?** My son and I go there for the lighting materials.
10. **How often do you go there to buy lighting materials in one year?**
Approximately 30 times a year.
11. **How long it takes to go to the place that you buy lighting material and come back home?** It takes about four hours.
12. **Do you think there any health problems with the lighting materials that you use now?** Yes, the family people get eye disease and inhalation problems easily, especially the women in my family get sick easily, because they do the housework at home in the smoky tents.
13. **What is your opinion of solar electricity generating panels?** I think it's really useful for us, we can have light at night without have any trouble, and especially for the women in my family, it could create a great environment to cook at night.
14. **Have you seen solar panels before? Where? When?** Yes I have seen it from one of my relatives in the local village a few months ago.

5. Solar Panel Project Survey

Date: October 8, 2008 **Interviewer:** རིན་མོ་མཚོ། **Place:** Tsanak Tibetan Village.

1. How many people are there in your family?

Name	Sex	Age
(a) རིན་མོ་མཚོ།	female	76
(b) དབང་ལྷན་རྒྱལ།	male	32
(c) འབྲུག་ལོ།	male	31
(d) ཚེ་ཐང་རྒྱུད།	female	10
(e) བསོད་ལོ།	male	13

2. **Annual family cash income?** 4,500RMB by herding
3. **How do you make lighting?** Candles, burning fuels, and butter lamps.
4. **What are your annual expenses for lighting?** 410RMB for the lighting materials
5. **What do you buy for lighting?** Candles, torch, diesel oil.

Item	Amount Use in 1 Year	Yearly Cost RMB
(a) candles	135	270
(b) diesel oil	10 kg	40

(c) torch	50 batteries	100
(d) yak dung	as above	
(e) butter lamp		
(f) wood		

- 6. What lighting material do you use that you don't pay?** We use yak dung, wood, and butter lamps.
- 7. How do you get that lighting material that you don't pay? Tell me about the time it takes, who gets it and so on?** We get the lighting materials in sacks while carrying them. We take the sacks and walk through the grassland to collect it. It takes about four or five hours. Sometimes we cannot get enough and it takes longer than usual.
- 8. Where do you buy lighting materials?** At the county town
- 9. Who goes to buy these materials?** My son goes there for the lighting materials.
- 10. How often do you go there to buy lighting materials in one year?** At least two times in a month.
- 11. How long it takes to go to the place that you buy lighting material and come back home?** It takes about five hours.
- 12. Do you think there any health problems with the lighting materials that you use now?** Yes, in my whole life I stay at home and do the housework. Every night I cook in the smoky kitchen room and now I cannot see well, because I got an eye disease from the smoke from burning fuels and candles.
- 13. What is your opinion of solar electricity generating panels?** I think it's very useful and convenient that we don't need to worry about the eye disease and other disease if we have the solar panel.
- 14. Have you seen solar panels before? Where? When?** Yes I have seen it at the local county in a store.

6. Solar Panel Project Survey

Date: October 8, 2008

Interviewer: རྫོག་མཚོ།

Place: Tsanak Tibetan

Village.

1. How many people are there in your family?

Name	Sex	Age
(a) རྫོག་མཚོ།	male	56
(b) མེ་འབྲུག།	male	55
(c) མཚོ་ལོ།	female	23
(d) རྫོག་མཚོ་ལོ།	male	22

(e) ལྷག་མཚོ།	female	20
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2. **Annual family cash income?** 3,500RMB by herding
3. **How do you make lighting?** Candles, burning fuels, and butter lamps.
4. **What are your annual expenses for lighting?** 288RMB for the lighting materials
5. **What do you buy for lighting?** Candles, batteries, diesel oil.

Item	Amount Used in 1 Year	Yearly Cost RMB
(a) candles	100	200
(b) diesel oil	12 kg	48
(c) torch	20 batteries	40
(d) yak dung	as above	
(e) butter lamp		
(f) wood		

6. **What lighting material do you use that you don't pay?** We use yak dung, wood, and butter lamps.
7. **How do you get that lighting material that you don't pay? Tell me about the time it takes, who gets it and so on?** We get the lighting materials in sacks on the grassland, which is about three or four km away from home. Usually my daughter and her husband go there to collect it.
8. **Where do you buy lighting materials?** The county town
9. **Who goes to buy these materials?** My daughter and her husband.
10. **How often do you go there to buy lighting materials in one year?** About 27 times.
11. **How long it takes to go to the place that you buy lighting material and come back home?** It takes about a half day.
12. **Do you think there any health problems with the lighting materials that you use now?** Yes, late every year when the New Year is coming, we clean the houses and tents; the most difficult thing is to clean the blackened walls and clothes, which are stained from burning fuels and candles.
13. **What is your opinion of solar electricity generating panels?** It's a fantastic thing for herders; it eliminates the heavy work of cleaning stained walls.
14. **Have you seen solar panels before? Where? When?** Yes, at a local villager's family this summer in the summer place.

7. Solar Panel Project Survey

Date: October 8, 2008 **Interviewer:** ཚོ་སྐྱབས། **Place:** Tsanak Tibetan Village.

1. **How many people are there in your family?**

Name	Sex	Age
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(a) ཚོ་སྐྱབས།	male	32
(b) ལྷག་མོ།	female	33
(c) ཚེ་དམྱོལ་མ།	female	12
(d) འབྲུམ་པ་རྒྱལ།	male	9
(e) མེ་ཉླག་མཚོ།	female	6

2. **Annual family cash income?** 4,000RMB by herding
3. **How do you make lighting?** Candles, burning fuels, and butter lamps.
4. **What are your annual expenses for lighting?** 240RMB for the lighting materials
5. **What do you buy for lighting?** Candles, batteries, diesel oil.

Item	Amount Used in 1 Year	Yearly Cost RMB
(a) candles	90	180
(b) diesel oil	10 kg	40
(c) torch	10 batteries	20
(d) yak dung	as above	
(e) butter lamp		
(f) wood		

6. **What lighting material do you use that you don't pay?** We use yak dung, wood, and butter lamps.
7. **How do you get that lighting material that you don't pay? Tell me about the time it takes, who gets it and so on?** We get the lighting materials in sacks on the grassland, which is about four km away from home. I take my 12 year old son to go there to collect it.
8. **Where do you buy lighting materials?** At the county town
9. **Who goes to buy these materials?** I go there to buy it.
10. **How often do you go there to buy lighting materials in one year?** About 25 times we go there for lighting materials.
11. **How long it takes to go to the place that you buy lighting material and come back home?** It takes about three hours by motorbike.
12. **Do you think there any health problems with the lighting materials that you use now?** Yes, my wife got an eye disease about three years ago. She is the house-worker in my family and she is doing housework in the smoky tents. So I think it's very risky for my children; they might become blind. I feel afraid of this.
13. **What is your opinion of solar electricity generating panels?** I think it's the most important thing and the helpful thing for nomads like us. If we have such an item we don't need to worry about anything about the health risks.
14. **Have you seen solar panels before? Where? When?** Yes I have seen it many

times at the local county town last year.

8. Solar Panel Project Survey

Date: October 8, 2008

Interviewer: གཡང་ཐར་རྒྱལ།

Place: Tsanak Tibetan

Village.

1. How many people are there in your family?

Name	Sex	Age
(a) གཡང་ཐར་རྒྱལ།	male	47
(b) ལྷགས་མོ་མཚོ།	female	75
(c) བོད་བདེ།	male	20
(d) མཚོ་ཤེ།	male	37
(e) ཚོ་རྫོ།	male	22

2. Annual family cash income? 3,800RMB by herding

3. How do you make lighting? Candles, burning fuels, and butter lamps.

4. What are your annual expenses for lighting? 320RMB for the lighting materials

5. What do you buy for lighting? Candles, batteries, diesel oil.

Item	Amount Used in 1 Year	Yearly Cost RMB
(a) candles	170	240
(b) diesel oil	5 kg	20
(c) torch	30 batteries	60
(d) yak dung	as above	
(e) butter lamp		
(f) wood		

6. What lighting material do you use that you don't pay? We use yak dung, wood, and butter lamps.

7. How do you get that lighting material that you don't pay? Tell me about the time it takes, who gets it and so on? We collect the fuels while dragging sacks behind us. It takes about three hours to go and get back home. My daughter usually goes there to collect it and it became their responsibility.

8. Where do you buy lighting materials? At the county town

9. Who goes to buy these materials? My son goes there to buy it.

10. How often do you go there to buy lighting materials in one year? About 30 times we go there for lighting materials.

11. How long it takes to go to the place that you buy lighting material and come back home? It takes about four hours by tractor.

12. Do you think there any health problems with the lighting materials that you

use now? Yes, my young daughter got cancer from inhaling the smoke every night while cooking. This is the biggest problem that the smoke caused.

13. What is your opinion of solar electricity generating panels? I think it's a very helpful thing for nomads like us. If we have such an item we don't need to worry about health risks.

14. Have you seen solar panels before? Where? When? Yes I have seen it one of my friends' family last year during the New Year when I visited him.

9. Solar Panel Project Survey

Date: October 8, 2008 **Interviewer:** བདེ་ཚེན་མཚོ། **Place:** Tsanak Tibetan Village.

1. How many people are there in your family?

Name	Sex	Age
(a) ལྷ་ལོ།	male	45
(b) བདེ་ཚེན་མཚོ།	female	32
(c) རྡོ་ལྷ།	male	19
(d) ལྷ་ལོ།	male	38
(e) འཕགས་མོ་མཚོ།	female	8
(f) ལྷ་ལྷོ་མཚོ།	male	42

2. Annual family cash income? 5,500RMB by herding

3. How do you make lighting? Candles, burning fuels, and butter lamps.

4. What are your annual expenses for lighting? 460RMB for the lighting materials

5. What do you buy for lighting? Candles, batteries, diesel oil.

Item	Amount Used in 1 Year	Yearly Cost RMB
(a) candles	130	260
(b) diesel oil	10 kg	40
(c) torch	80 batteries	160
(d) yak dung	as above	
(e) butter lamp		
(f) wood		

6. What lighting material do you use that you don't pay? Yak dung, wood, and butter lamps.

7. How do you get that lighting material that you don't pay? Tell me about the time it takes, who gets it and so on? We collect the fuel and get them by tractor, so we spend time to go to the grassland for the fuel. It takes about two

hours to get. Usually my son and daughter get fuel from the grasslands.

- 8. Where do you buy lighting materials?** At the local town
- 9. Who goes to buy these materials?** My son goes there.
- 10. How often do you go there to buy lighting materials in one year?** About 40 times.
- 11. How long it takes to go to the place that you buy lighting material and come back home?** It takes about five hours by walking.
- 12. Do you think there any health problems with the lighting materials that you use now?** Yes, for years we have done housework using burning fuels and candles for light. Everyone has the same disease--eye disease and inhalation problems. It's very dangerous if we continue to stay in smoky rooms and tents.
- 13. What is your opinion of solar electricity generating panels?** It's really a great thing for herders at night; we can do other housework at night under the light of the solar panel. Also we can watch TV and see everything.
- 14. Have you seen solar panels before? Where? When?** Yes, at the local county town and at a friend's home.