

“Project Formulation Survey” under the
Governmental Commission on the Projects
for ODA Overseas Economic Cooperation
in FY2012

Summary Report

Socialist Republic of Viet Nam

Project Formulation Survey on
Improvement of Roof by Energy Saving,
Solar Energy, and DRR

March 2013

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Mohri, Architect & Associates, Inc.

This report is a summary of a project formulation survey conducted by the contractor, under the Governmental Commission on the Project for ODA Overseas Economic Cooperation, commissioned by the Ministry of Foreign Affairs of Japan in Fiscal Year 2012. It does not necessarily represent the official views of the Ministry of Foreign Affairs of Japan.

Introduction

1. Background of the Survey

The Socialist Republic of Viet Nam (hereinafter referred to as “Vietnam”) is one of the economic development centers in Asia experiencing a high economic growth rate. At the same time, the country has an annual increase of 14% in electricity consumption. Since the increase in demand is rapid, the overall electricity supply is not always stable, and the stabilization of the electricity supply is a challenge to be overcome for the economic development of Vietnam.

The Government of Vietnam plans to use coal and gas as the principal source of electricity for the time being. However, in the long run, the Government plans to reduce the dependence on fossil fuels and expand the use of renewable energy, and is aiming to cover 5.6% of the total power generation with renewable energy, such as solar power and wind power, by 2020, and 9.4% of that amount by 2030.

2. Objective of the Survey

Taking into consideration the above mentioned situation, this present Survey aims to contribute to the development issues in Vietnam by cooperation through ODA projects, and by introducing relevant products and technologies of small/medium size Japanese enterprises.

Specifically, the Survey aims to develop ODA projects that will introduce roof materials and technical methods for energy saving, energy creation, and energy storage to public facilities, to be utilized as a complementary energy resource or as electricity in case of emergency. Also, the possibility of disaster risk reduction (DRR) will be considered by strengthening and improving the durability of the roof. In addition, the Survey aims to develop a project that can contribute to raising awareness of climate change and consciousness of environmental issues by visualizing the function and effectiveness of energy saving and energy creation on the roofs of public facilities.

Considering the limited amount of budget for ODA, in order to maximize the effectiveness and to target symbolic facilities, the Survey will be implemented to develop new ODA projects with a focus on facilities constructed by past Japanese Grant Aid projects.

I. Description of the current situation and development needs of the concerned development issues in the surveyed country

1. Overview of Vietnam

Vietnam has been promoting the Doi Moi (restoration) policy with the application of a market economy system and open-door policy, and has realized high economic growth with average of 6.6% in the 1990s, and average of 7.3% between 2000-2010, which includes the world economic crisis. In the Congress of the Community Party of 2011, a policy was declared to continually aim for high economic growth in order to become a modern industrialized state by the year 2020.

2. Situation and Needs in Energy/Environment Sector

Vietnam is now transferring from gas thermal power generation to coal thermal power generation to meet the increasing demand of electricity due to rapid economic growth, expanding at approximately 14% per year. However, there is still need for expansion of imports, as well as diversification of power sources with alternatives such as nuclear power and renewable energy. In Vietnam, the electricity price is extremely low by world standards, at around 4 yen per kWh. In order to provide a stable power supply, fixing an appropriate electricity price based on actual cost is a challenge to be overcome.

Some of the reasons why the Vietnamese government aims to accelerate the use of renewable energy is 1) responsibility for the reduction of CO₂ emissions to prevent global warming, which emerging countries are expected to cover, and 2) political perspective in the long term (not immediate cost effectiveness) to save the limited fossil fuels¹ for the next generation. Furthermore, the subject of the cost effectiveness of renewable energy, such as solar energy, is a political issue that cannot be discussed only by reviewing the cost, since the issues of receding fossil energy and anti-nuclear arguments concern developed countries including Japan. Action by the public sector to expand and promote renewable energy, which is slow-moving in the market, is an important role of the government, along with a policy for clean energy and the advancement of diversification of energy.

3. Policies and Development plan in the Energy/Environment Sector

In the Seventh National Power Development Plan (2011-2020), the target of expansion of production and import of electricity expects a vast increase at approximately 2.1 trillion kWh by 2015 and 3.6 trillion kWh for 2020. The target for renewable energy is 5.6% of the whole production by power plants in 2020, and 9.4% of the same in 2030. In addition, in the Law on Energy Efficiency and Conservation established in 2011, the policy declares to “prioritize rational development of clean energy, and promote energy saving by increasing the proportion of renewable energy”, and for this objective, it indicates that “in order to enhance consciousness

¹ Estimated to be depleted in 46 years (petroleum), 118 years (coal), 58 years (natural gas), 106 years (uranium) respectively.

publicity and promotion activities shall be implemented, and that it shall be integrated in the school education in an adequate manner.”

II. Possible applicability of the SME’s products and technologies, and prospects for future business development

1. The strong points of proposed products/technologies of the SME

The proposing SME has developed many in-house products, holding numerous rights to industrial property², and is acknowledged as “Gantan with technology” in the metal roofing industry in Japan. Although the SME has realized “Fast and Easy” through systematization of products and construction, there is still a challenge for competitiveness in cost, due to high specifications and quality. Presently, the SME is working on an analysis of needs and the local situation through this project formulation survey, as well as a review of material and structure at the Hakushu Technical Center, and plans to realize improvements and cost reduction.

Efforts have been made by the proposing SME to contribute to counteraction of global warming and to promote integration of environmental technology and roofing material by development of “insulation method”, “all-in-one type top light roof”, and “green roof”. Furthermore, efforts have been made for the development of solar energy for more than 20 years, and with the request from NEDO, have accomplished the development of all-in-one type solar panel roofing for the first time in Japan. Also, an original solar panel product with a double-faced light receiving system “Sun-Both” was developed. The SME is working on efficient energy generation in a limited space and countermeasures for the heating-up of solar batteries, in order to develop technologies favorable for use in developing countries, which are mainly located in tropical regions. In addition to these environmental technologies and products, the SME is working on high-strength roofing to prevent damages from disasters. Therefore, it is a strong point of the SME to provide the three types of technologies: 1) Technology to contribute to the Conservation of energy and resources, 2) Technology to utilize natural energy, and 3) Technology to resist large-scale disasters, as a single package.

As an overseas business, the SME has a history of participation starting from the House of Parliament in Sri Lanka 30 years ago, with works on the roof of public facilities and Embassy buildings mainly in Asia. Also, the SME took part in the “Clean Energy Project” to install roofing and solar panels on public facilities in South Asia and Central America.

2. Overseas expansion as part of Business development of the SME

The SME considers that it is possible to provide its products and technology to protect the global environment, counteract the effects of climate change and respond to frequent disasters. With this ability, the SME intends to realize active overseas business development through collaboration with the Japanese ODA, which takes part in global-wide challenges.

² Application of : 1,231 patents, 217 utility models, 2,399 designs, and 178 trademarks

To realize these intents, it is required to analyze the Asian market in depth, clarify “How,” “To whom,” “At how much,” and “What” to market, and develop a strategy. In addition, the products must be developed in market-in base and not product-out. For such applications, relevant time for development, improvement, demonstration, promotion and expansion, as well as establishment of a residing office in Vietnam will be considered.

3. Contribution to the economy in the local community

Kanagawa prefecture, where the SME is located, is promoting the “Framework for Smart Energy in Kanagawa”. Within this framework, the SME provided installation methods of solar panels in the demonstration for development and promotion. Furthermore, the SME installed solar panels on 54 public schools (primary and secondary) in Fujisawa City, and participated in education of conservation, generation, and stocking of energy as well as the global environment in educational settings. This survey result and the realization of the project in Vietnam will be reflected in and contribute to the advancement of this framework.

Outside of the SME, there is a peripheral organization of 700 excellent construction companies with 8,000 technicians for roofing. Most of them are small and medium size enterprises, but they have interest in overseas business, and some of them have already participated in particular projects. The outcome of this proposed project will not only be a benefit to the proposing SME, but will also be a benefit for these peripheral SMEs.

4. Intended Business plan

Through evaluation of existing public facilities built by Japanese ODA, a detailed plan for “Project for Energy Saving, Solar Energy and DRR by improvement of roof” will be proposed. The SME intends to succeed and participate in the realization stage through fare competitions, including participation as a sub-contractor.

In addition, studies will be implemented to seek the possibility of BOP business to reach not only the middle-income class but also the low-income class. For energy saving and solar energy generation for large-scale facilities, marketing and promotion will be planned targeting the factories of Japanese manufactures, and attempt to expand the market to the Vietnamese private sector as well. The brand name of “Gantan” will be promoted through these activities, but efforts will be made to participate in landmark-type buildings with the original strongpoint of design quality.

5. Operation system and specific schedule for promotion

One of the possible partners for future cooperation has 10 years of business experience in Vietnam, with a variety of implementation achievements in manufacturing and construction of roofs for Japanese factories in Vietnam. The proposing SME will work with this partner enterprise, and in the future, intends to entrust manufacturing locally or implement direct production in Vietnam as a metal roofing manufacturer.

The intended schedule is indicated below.

Table 1 Schedule for promotion (tentative)

Fiscal Year	Activities
2013	Participation in Project Formulation Survey, market analysis
2014	Development of products applicable in Vietnam, planning of establishment of resident office in Vietnam
2015	Establishment of resident office in Vietnam, preparation for local manufacturing system
2016	Start full-dress manufacturing in Vietnam
2017	Export to neighboring countries and Japan, arrangement and reinforcement of marketing network
2018	Refinement of locally applicable products, evaluation of resident office
2019	Preparation for local subsidiary, expansion of export to neighboring countries
2020	Establishment of local subsidiary or continuation of resident office (5 years)

III. Effect on business development of the proposing SMEs in the surveyed countries through proposed ODA projects

1. Consistency between the proposed products/technologies and the development needs

Japan is supporting Vietnam, who aims to be duly industrialized by 2020, with three pillars of development approach: “Strengthening the international competitiveness” “Addressing Vulnerability” and “Strengthening of Governance”. The project made and proposed based on this Project Formulation Survey will particularly contribute to “Measures for Climate Change” and “Green growth strategy” under the “Addressing Vulnerability” pillar.

As mentioned above, the expansion of power sources and diversification of energy is needed to meet the increasing power demand in Vietnam, and one of the aims is promotion of the use of renewable energy. In addition, from the results of Field Survey, it has been confirmed that the electricity supply is still unstable, and there is need for high-strength roofing material to resist the frequent natural disasters. The strongpoint of the proposing SME is its ability to provide three types of technology by improvement of roof material, which are “Technology to contribute to conservation of energy and resources” , “Technology to utilize natural (clean) energy” , and “Technology to resist large-scale disasters” , and the consistency between these technologies (products) and the development needs are high.

The proposed products, arranged by theme of technology, are indicated below.

Table 2 Proposed products by theme of technology

Theme of technology	Function of proposed products (product name)
Technology to contribute to conservation of energy and resources	<ul style="list-style-type: none"> • High-weatherproofing sheet (Sarna roof) • System ventilation riser
Technology to utilize natural (clean) energy	<ul style="list-style-type: none"> • All-in-one type solar panel roofing (Sun-pastem waterproofing, Aluminum sash cover waterproofing) • Double-faced light receiving solar panel (Sun-both) • Ventilation accelerating wing (Gantan wing)
Technology to resist large-scale disasters	<ul style="list-style-type: none"> • High-strength roof: Interlocking clip type folded sheet roofing (L-100)

2. Effectiveness for expansion of SME's business by implementation of ODA project

- (1) Development of products/technologies to conform with the conditions in Vietnam
- (2) Formation of network with the central government and other governmental institutions
- (3) Reinforcement of cooperation with VNCC and other agencies of VC Group
- (4) Build network with private companies (general contractors, architect offices, consultants)
- (5) Possibility of collaboration with people/enterprises in the solar energy generation sector

IV. Proposals for formulating ODA projects

1. Candidate projects for Project Formulation

In this Project Formulation Survey, the Survey Team conducted Field Survey I from December 2nd to 15th, 2012, and Field Survey II from January 8th to 20th, 2013. During the Field Surveys in Vietnam, the Team implemented site surveys targeting 19 public facility construction projects³ by past Japanese ODA to check the present condition of the facility and the roof, and to collect information regarding maintenance and operation of the facility.

Table 3 Candidate projects for Project Formulation

No.	Fiscal Year	Project name	Region	Description
1	1970-1975	Cho Ray hospital (construction of the main building and annex)	Ho Chi Minh City	Construction of the main building and annex of Cho Ray hospital. (Related project for improvement of M&E and medical equipment from 1993.)
2	1993	Project for the Improvement of the Facilities and Equipment of the Faculty of Agriculture, Can Tho University	Can Tho City	Construction of Administration building, Classroom building, and Experiment buildings
3	1994	Project for the Improvement of the Facilities of Primary Schools	Thai Binh, Ha Nam, Nam Dinh, Ninh Binh	Construction of administration building, classroom building and Toilet building at 30 primary schools (348 classrooms)
4	1994	Project for Construction of Fishing Port Facilities at Vung Tau	Vung Tau City	Coastal civil engineering facilities (jetty, coast protection) and architectural facilities (ice-making plant, Chilling and Cold storage, Warehouse, Workshop space, etc.) M&E facility, and equipment/vehicle
5	1995	Project for the Improvement of the Facilities of Primary Schools (Phase 2)	Thanh Hoa, Nghe An, Ha Tinh	Construction of classrooms, administration office, and toilet building at 40 primary schools
6	1996	Project for the Improvement of the Facilities of Primary Schools (Phase 3)	Quang Binh, Quang Tri, Thua Thien-Hue	Extension/rebuilding of classrooms, new construction of teachers' room, toilet, and water supply/drainage facility at 45 primary schools
7	1997-1998	Project for the Improvement of the Facilities of Primary Schools (Phase 4)	Quang Nam, Quang Ngai, Bin Dinh, Phu Yen, Khanh Hoa, Binh Thuan, Quang Ninh	Construction of classrooms, teachers' room, toilet, and water supply/drainage facility at 80 primary schools
8	1997-2000	Project for Improvement of the Bach Mai Hospital	Hanoi City	Construction of ward, technical block, machinery room, and procurement of medical equipment
9	2000-2001	Project for Improvement of Facilities of Primary Schools in the Northern Mountain Region (Phase 1)	Ha Giang, Lai Chau, Cao Bang, Bac Can	Construction of classrooms, principal's room, equipment room, and toilet, and procurement of educational equipment
10	2000	Project for Construction of Viet Nam - Japan Human Resources Cooperation Center	Hanoi City	Construction of the Center (library, multi-purpose room, computer room, director's room, meeting room, etc.) and procurement of related equipment
11	2000	Project for Construction of Viet Nam - Japan Human Resources Cooperation Center in Ho Chi Minh City	Ho Chi Minh City	Construction of the Center (library, multi-purpose room, computer room, director's room, meeting room, etc.) and procurement of related equipment
12	2000	Project for Improvement of Transport Technical and Professional School No.1	Ba Vi, Ha Tay	Construction of training room, dormitory for students, administration building, and procurement of equipment
13	2002-2005	Project for the Construction of the Facilities for Measles Vaccine Production	Hanoi City	Construction of Production building, Animal laboratory, Mechanical building, procurement of equipment, and technical assistance
14	2002	Project for Construction of Marine Culture Research and Development Center in Nha Trang	Nha Trang, Khanh Hoa	Construction of facilities (Administration and Research Building, Blood stock tank building, Breeding and Rearing Building, Machine building, Pump building, Seawater Tank, Guard room), procurement of equipment
15	2003	Project for Improvement of Facilities for the Hue Central Hospital	Hue City	Construction of central medical treatment building, outpatient treatment building, and machinery room, and procurement of medical equipment
16	2003	The Project for Improvement of Facilities of Primary Schools in the Northern Mountain Region (Phase 2)	Bac Giang, Thai Nguyen, Phu Tho, Tuyen Quang	Construction of classrooms, principal's room, equipment room, and toilet at 48 primary schools, procurement of school furniture, and technical assistance
17	2003	Project for Improvement of the Surrounding Area of My Son Sanctuary	Quang Nam	Construction of exhibition building, tourists' laboratory building, administration building, procurement of equipment, and technical assistance
18	2005	Project for the Improvement of Hoa Binh General Hospital	Hoa Binh City, Hoa Binh	Construction of technical building, annex building (incinerator, machinery room), procurement of medical equipment, and technical assistance
19	2006	Project for Improvement of Safety Laboratory for National Institute of Hygiene and Epidemiology	Hanoi City	Construction of BSL-3 laboratory and associated facilities, procurement of laboratory equipment, and technical assistance
20	2007	Project for Empowerment to the Community Damaged by Forest Fire in Ca Mau Province	Ca Mau	Improvement of forest land, Civil work including waterway, road, and bridge, Construction of watchtower and center, health center, and primary school, and procurement of equipment
21	2008	Project for the Reinforcement of Custom Functions at the Tan Cang Cat Lai Port of Ho Chi Minh City	Ho Chi Minh City	Construction of facility for large-scale X-ray, Procurement of large-scale X-ray device
22	2009	Project for the Reinforcement of Custom Functions at the Haiphong Port	Hai Phong Port	Construction of facility for large-scale X-ray, Procurement of large-scale X-ray device

[Selection of target projects]

Based on the information collected in the Field Survey, the facilities of the candidate projects were evaluated from three aspects; condition of execution, need for improvement, and

³ The 6 projects for improvement of primary schools have 40-80 sites respectively, spread out in several Provinces. Therefore, site surveys were implemented as sample surveys in an average of three schools per project.

effectiveness. After this evaluation, the Team concluded that the facilities of primary education and hospitals have comparatively high relevancy and need for roof improvement.

The results of the evaluation are shown below.

Table 4 Evaluation of the surveyed facilities⁴

No.	FY	Name of Project	Conditions					Needs					Efficacy			Total score	Overall Evaluation
			a	b	c	d	e	f	g	h	i	j	k	l			
			There is enough space to place the solar panels	There are no obstacles	There is no concern for damage from salt	It is favorable location with sufficient radiation and sunshine hours	There is no need for large-scale supplementary works/repairs	The frequency of blackouts is high	It is used as an evacuation shelter/need to strengthen the function for DRR	There is need for repair of roof	There is need to improve the interior environment (ex: lighting)	Contribute to alternative electricity in case of blackouts (especially where no generator is available)	Request for improvement from the CP or administration of the facility	High public impact. Used by people of the community (high efficacy on publicity and environmental education)			
1	1970-1975	Cho Ray hospital (construction of the main building and annex)	○	○	○	○	×	△	×	○	×	×	○	17	A		
2	1993	Project for the Improvement of the Facilities and Equipment of the Faculty of Agriculture, Can Tho University	○	○	○	○	△	△	×	×	○	○	×	14	B		
3	1994	Project for the Improvement of the Facilities of Primary Schools	○	○	○	△	△	○	×	○	×	○	○	21	A		
4	1994	Project for Construction of Fishing Port Facilities at Vung Tau	○	○	×	○	○	○	△	×	×	△	○	14	B		
5	1995	Project for the Improvement of the Facilities of Primary Schools (Phase 2)	○	○	○	△	△	○	×	○	×	○	○	21	A		
6	1996	Project for the Improvement of the Facilities of Primary Schools (Phase 3)	○	○	○	○	○	○	○	○	×	○	○	25	A		
7	1997-1998	Project for the Improvement of the Facilities of Primary Schools (Phase 4)	○	○	○	○	○	○	○	○	×	○	○	25	A		
8	1997-2000	Project for Improvement of the Bach Mai Hospital	○	○	○	△	○	×	×	×	×	△	○	15	A		
9	2000-2001	Project for Improvement of Facilities of Primary Schools in the Northern Mountain Region (Phase 1)	○	○	○	△	○	○	×	×	×	○	○	20	A		
10	2000	Project for Construction of Viet Nam - Japan Human Resources Cooperation Center	△	×	○	△	△	○	×	×	×	×	○	11	C		
11	2000	Project for Construction of Viet Nam - Japan Human Resources Cooperation Center in Ho Chi Minh City	△	○	○	○	△	△	×	×	×	×	○	13	B		
12	2000	Project for Improvement of Transport Technical and Professional School No.1	○	○	○	△	○	○	×	×	×	○	△	14	B		
13	2002-2005	Project for the Construction of the Facilities for Measles Vaccine Production	○	○	○	△	○	△	×	×	×	×	○	12	B		
14	2002	Project for Construction of Marine Culture Research and Development Center in Nha Trang	○	○	×	○	○	△	×	×	×	○	△	12	B		
15	2003	Project for Improvement of Facilities for the Hue Central Hospital	○	○	○	○	○	×	×	×	×	×	○	17	A		
16	2003	The Project for Improvement of Facilities of Primary Schools in the Northern Mountain Region (Phase 2)	○	○	○	△	○	○	×	×	×	○	○	20	A		
17	2003	Project for Improvement of the Surrounding Area of My Son Sanctuary	○	○	○	△	○	-	×	×	×	○	-	13	B		
18	2005	Project for the Improvement of Hoa Binh General Hospital	○	○	○	△	○	○	×	×	×	×	○	18	A		
19	2006	Project for Improvement of Safety Laboratory for National Institute of Hygiene and Epidemiology															
20	2007	Project for Empowerment to the Community Damaged by Forest Fire in Ca Mau Province															
21	2008	Project for the Reinforcement of Custom Functions at the Tan Cang Cat Lai Port of Ho Chi Minh City															
22	2009	Project for the Reinforcement of Custom Functions at the Haiphong Port	○	○	×	△	○	○	×	×	×	△	×	10	B		

2. Specific proposal for cooperation




In this proposed project, rehabilitation/ reinforcement of roof will be planned, applying the products/technologies of the SME from the perspective of Energy saving, Solar Energy, and Disaster Risk Reduction (DRR). In addition, transfer of technology/method by on-the-spot technical seminars⁵ on installation of solar panels will be planned for people engaged in the construction and technical officers/engineers of the responsible ministries.

(1) Contents and estimated cost by type



The contents of proposed projects and the estimated cost by type are as indicated below. It should be noted that it is possible to design a project, depending on its size and budget, with different combinations of these proposed types.

⁴ The evaluation allotment for items “a-k” is ○=2 points, △=1 point, ×=0, for item “l” is ○=5 points, △=2 points, ×=0, and overall evaluation is rated as A=more than 15, B=10 to 14, C= 9 or below.



⁵ The seminar will be conducted by Japanese technician(s) with the objective to introduce/explain the proposing SME’s products/technologies, and to give instruction on reroofing and installation of solar panels. The seminar will cover 1) Basic information on metal roofing and solar panels, 2) Security management, and 3) Planning of execution schedule.

Educational Facility (Primary schools)	Contents of improvement		Target Project	Concerned region/ Number of sites ⁶
	Rehabilitation of roof	Solar panel		
Type S-1 	Install frames for solar panels which enable future rehabilitation of roofing <u>Aluminum sash cover waterproofing method</u>	Solar panel (10kW) Double-faced light receiving system	Project for Improvement of Facilities of Primary Schools in the Northern Mountain Region	Ha Giang, Lai Chau, Cao Bang, Bac Can (4 sites)
			Project for Improvement of Facilities of Primary Schools in the Northern Mountain Region (Phase 2)	Bac Giang, Thai Nguyen, Phu Tho, Tuyen Quang (4 sites)
20,507 JPY*/ site	4,418 JPY/site	16,089 JPY/site		
Type S-2 	Replace the decrepit roof with metal roofing (folded-plate) <u>Interlocking clip type folded sheet roofing (L-100) + system ventilation riser</u>	Solar panel (10kW) Double-faced light receiving system	Project for the Improvement of the Facilities of Primary Schools (Phase 3)	Quang Binh, Quang Tri, Thua Thien-Hue (3 sites)
			Project for the Improvement of the Facilities of Primary Schools (Phase 4)	Quang Nam, Quang Ngai, Bin Dinh, Phu Yen, Khanh Hoa, Binh Thuan, Quang Ninh (7 sites)
25,189 JPY/site	9,431 JPY/site	15,758 JPY/site		
Type S-3 	Replace the decrepit roof with all-in-one type solar panel roofing (10kW), and replace with folded-plate metal roofing <u>Sun-pastem waterproofing method</u>	Solar panel (10kW) Double-faced light receiving system	Project for the Improvement of the Facilities of Primary Schools	Thai Binh, Ha Nam, Nam Dinh, Ninh Binh (4 sites)
			Project for the Improvement of the Facilities of Primary Schools (Phase 2)	Thanh Hoa, Nghe An, Ha Tinh (3 sites)
23,144 JPY/site	7,284 JPY/site	15,860 JPY/site		

*: For estimated cost, JPY=thousand Japanese Yen

Medical facilities (Hospitals)	Contents of improvement		Target Project	Concerned region/ Number of sites
	Rehabilitation of roof	Solar panel		
Type H-1 	Apply high weather-resistant PVC waterproofing on top of the existing polyurethane waterproofing <u>Sarna roof</u>	Solar panel (20kW) Double-faced light receiving system	Hoa Binh General Hospital	Hoa Binh City, Hoa Binh Province
Type H-2 	Apply high weather-resistant PVC waterproofing on top of the existing protective concrete layer of waterproofing <u>Sarna roof</u>	Solar panel (30kW) Double-faced light receiving system	Bach Mai Hospital	Hanoi City

⁶ One Primary school that meets the following criteria will be selected from each Province as a pilot site; located in the provincial capital or along the trunk road near the provincial capital where expanding and PR is prospective; schools where electricity needs are high and digital equipment has been installed due to a change in curriculum and programs; schools where maintenance of facility and equipment is implemented adequately.

Type H-3 	Place all-in-one type solar panel roofing (30kW) by using the high-side light section at the center of roof. Double-faced light receiving system. <u>Sun-pastem waterproofing method</u>		Hue Central Hospital	Hue City, Thua Thien-Hue Province
35,957 JPY	6,807 JPY	29,150 JPY		
Type H-4 	Remove the decrepit ALC panels, and replace with folded-plate metal roofing <u>Interlocking clip type</u> <u>folded sheet roofing</u> (L-100)	Solar panel (30kW) Double-faced light receiving system	Cho Ray Hospital	Ho Chi Minh City
60,825 JPY	31,305 JPY	29,520 JPY		

*: For estimated cost, JPY=one thousand Japanese Yen

(2) Execution Schedule

In the case of applying the promotion project (extension type), the operating and managing institution will select the enterprise by tender or proposal method. After concluding a contract with the procuring institution, the selected enterprise will implement works, in the order of site survey, product design, and product manufacturing. The products will be manufactured in Japan or in neighboring countries and be shipped to the ports of Vietnam by sea, and then transported to the sites by inland transportation. After preparation and procurement of labor by the responsible enterprise, the construction will begin. For the rehabilitation of roofs and installation of solar panels, the estimated construction period for both hospitals and primary schools is two months per building. During this construction period, technical seminars will be held for people concerned from responsible ministries and workers engaged in the construction.

Since there will be more than one site for primary schools, the second site will start one month after the commencement of work at the first site. Also, construction during vacation time will be considered when there is no concern for traffic of pupils or interference of lessons, in order to minimize the effect on the management of the school.

An example of the execution schedule is shown below.

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
Agreement between the two governments		▲													
Procurement notice		□													
Proposal			■												
Negociation and concluding of contract				■											
Preparation in Japan, Site surveys in Vietnam					■										
Designing of products						■									
Manufacturing of products							■								
Tranportation (by sea/ by land)								■							
Rehabilitation/ reinforcement of roof	Preparation							■							
	School facility 1								■	■	■				
	School facility 2									■	■	■			
	School facility 3										■	■	■		
	Hospital											■	■	■	
	Technical seminar									■	■	■			

Execution schedule (tentative plan)

(3) Contents to be undertaken by the Recipient country

For smooth implementation of the project, fulfillment of the contents to be undertaken by the Vietnamese side is essential. Since the target facilities are hospitals and primary schools that are visited and utilized all the time, it is a requirement to secure the relevant construction area, and to cooperate for the security of people concerned as well as visitors to the facilities. Also, cooperation for smooth approval is required for necessary permission and tax exemption for enterprises and individuals working for this project.

Regarding the maintenance of target projects, solar panels do not require particular maintenance procedures, since it will be naturally cleaned by rainwater washing away the dust. However, since dust and/or unexpected objects cause decline in efficiency, the condition and amount of power generation shall be monitored periodically. For the rehabilitated roofs, development of a medium and long term maintenance plan is recommended. For short-term maintenance, the roof surface and the gutter shall be cleaned regularly.

3. Expected Development impact by execution of ODA project

The government of Japan has been implementing cooperation programs with the three pillars of “Strengthening the international competitiveness”, “Addressing Vulnerability”, and “Strengthening of governance”. This newly proposed project contributes especially to “Measures for Climate Change” and “Green Growth Strategy”, within the “Addressing Vulnerability” pillar.

In the short term, the situation of power supply will be improved by providing a complement to the electricity supply during normal times and installation of an alternative power source for emergencies. At the same time, by visualizing electricity consumption, the awareness of energy savings is expected to advance as a result of implementation of this project. Furthermore, it is expected that these public facilities will be used as evacuation shelters.

In the long run, this project will contribute to awareness raising toward environmental issues by using renewable energy and the promotion of energy saving as a countermeasure to

global warming, diversification of energy sources, and realization of the Vietnamese policy “National Power Development Plan 2011-2020 with vision to 2030”.

SMEs and Counterpart Organization

- Name of SME: Gantan Beauty Industry Co., Ltd. and Mohri, Architect & Associates, Inc.
- Location of SME : 1-1-21 Shonandai, Fujisawa, Kanagawa, 252-0804 Japan and 3-4-7 Nihonbashi-Honcho, Chuo-ku, Tokyo, 103-0023 Japan
- Survey Site : Urban and Rural areas in Vietnam
- Counterpart Organization : Ministry of Health, Ministry of Education and Training, etc.

Concerned Development Issues

Development , Strengthening competitive advantages

- Stabilize supply to meet the growing demand for electricity
- Improvement of infrastructure

Response to vulnerability

- Approaches for global environment
- Energy saving, Green Growth Strategy
- Response to natural disasters such as typhoon (DRR)

Energy Master Plan VII and Law on Energy Conservation

- Diversification of energy and prioritization of renewable energy

Products and Technologies of SMEs

➢ Technology to exploit and utilize natural energy

High insulation (base layer, Gantan board), System ventilation riser, Top light for improvement of natural lighting, green-roof

➢ Technology to contribute to energy saving and conservation of natural resources

All-in-one system (Non-shadow solar roof, Mattara solar roof, Sun-pastem), Utilization of Truss (Techno-truss), Double-faced solar module (Sun-Both), Ventilation accelerating wing (Gantan wing)

➢ Technology to provide for large-scale disasters

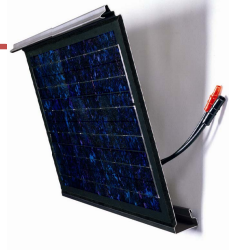
3 layer water-proofing (High-tech metal roofing+ insulating backup material+ insulating base layer), high-strength to resist large-scale natural disaster (Interlocking clip type folded sheet roofing, maximum wind resistance), prevention of falling of ceiling (Gantan Yugatakou+ Punching board+ Mesh)

Proposed ODA Projects and Expected Impact

- Installation of solar energy generation system and reinforcement of roof, targeting the primary schools built by Japanese ODA (especially those in typhoon vulnerable area) →Complement power generation, establish awareness of environmental issues, function as evacuation shelter
- Installation of solar energy generation system to the 4 general hospitals built by Japanese ODA→ Complement power generation, establish awareness of environmental issues

Future Business Development of SMEs

- Expansion of Market respecting design and function (export of products & construction supervision) + market survey
- Expansion toward the “volume zone”, namely the middle class (product development, local manufacturing, arrangement of sales network, human resource development, etc.)



Attachment: Outline of the Survey

1. Schedule of the Survey

(1) Field Survey I

Date	a		d		c		d		e		f		g		h	
	Leader/ CSR		Oversea trade		Manufacture technology 1		Manufacture technology 2		Construction technique 2		Project Manager / Survey on development needs		Survey on Social and Development issues		Survey on Facility/Infrastructure	
	Masahiro KOBAYASHI		Manari HAYASHI		Masahiro TAMURA		Yuichi INABA		Kazumichi NISHIDA		Hiroyuki YOSHIZAWA		Yukiko OKADA		Kazuma KOIZUMI	
	14 days		7 days		7 days		7 days		7 days		14 days		14 days		14 days	
11/30	Fri		Narita→Bangkok													
12/1	Sat		Bangkok													
1	12/2	Sun	Tokyo 10:00 (VN311)⇒Hanoi 14:30		Bangkok⇒Hanoi				Tokyo 10:00 (VN311)⇒Hanoi 14:30				Tokyo 9:30 ⇒Ho Chi Minh 14:25			
2	12/3	Mon	Meeting with JICA Vietnam Office, MoET. Site survey: Vietnam-Japan Human Resources Cooperation Center (Hanoi)		Preparation of the seminar Site survey:Vietnam-Japan Human Resources Cooperation Center (Hanoi)				Meeting with JICA Vietnam Office, MoET Site survey: Vietnam-Japan Human Resources Cooperation Center (Hanoi)		Accompany (f)		Architectural survey			
3	12/4	Tue	Seminar 1 (Hanoi)						Seminar 1		Meeting with CP, Survey on operation and management		move to Can Tho Site survey: Faculty of Agriculture Can Tho University			
4	12/5	Wed	Hanoi 8:30 (VN1127)⇒Ho Chi Minh10:30 Site Survey: Vietnam-Japan Human Resources Cooperation Center (Ho Chi Minh) Preparation for Seminar						Hanoi 8:30 (VN1127)⇒Ho Chi Minh10:30 Accompany (a)		Hanoi 8:30 (VN1127)⇒Ho Chi Minh10:30 Social-economical survey		Site survey: Faculty of Agriculture Can Tho University Move to Ho Chi Minh			
5	12/6	Thu	Seminar 2 (Ho Chi Minh)						Seminar 2		Accompany (h)		Site Survey: Improvement of Facilities of Primary Schools (phase 4)			
6	12/7	Fri	Site survey: Cho Ray Hospital						Site survey: Cho Ray Hospital		Accompany (h)		Site survey: Fishing port at Vung Tau			
7	12/8	Sat	Project development survey		Ho Chi Minh 0:15 (VN300)⇒Narita 7:45				Survey on Development needs		Social-economical survey		Architectural survey			
8	12/9	Sun	Ho Chi Minh 12:30 (VN1140)⇒Hanoi 14:30						Ho Chi Minh 14:40 (VN1372)⇒Hue 16:00		Ho Chi Minh 12:30 (VN1140)⇒Hanoi 14:30		Ho Chi Minh12:20 ⇒ Nha Trang 13:15			
9	12/10	Mon	Survey on Development needs						Site survey: Hue Central Hospital		Social-economical survey		Site survey: Marine culture Research and Development Center Nha Trang21:05 ⇒ Hanoi 22:50			
10	12/11	Tue	Courtesy call to the Embassy of Japan, Meeting with AFD, GDVC						Site Survey: Improvement of Facilities of Primary Schools (phase 3) Hue 13:20(VN1544)⇒Hanoi 14:30		Meeting with AFD, GDVC		Courtesy call to the Embassy of Japan, Architectural survey			
11	12/12	Wed	Site survey: Hoa Binh General Hospital						Site survey: Hoa Binh General Hospital		Accompany (h)		Site survey: Haiphong Port Custom immigration			
12	12/13	Thu	Site survey: Bach Mai Hospital, Measles Vaccine Production Facility						Site survey: Bach Mai Hospital, Measles Vaccine Production Facility		Accompany (f)		Site survey: Transport Technical and Professional School No. 1			
13	12/14	Fri	Courtesy call to JICA Vietnam Office, MOH, VNCC						Courtesy call to JICA Vietnam Office, MOH, VNCC		Accompany (h)		Site Survey: Improvement of Facilities of Primary Schools in Northern Mountain			
14	12/15	Sat	Hanoi 0:10⇒Tokyo 7:00						Hanoi 0:10⇒Tokyo 7:00		Hanoi 0:10⇒Tokyo 7:00		Hanoi 0:10⇒Tokyo 7:00			

(2) Field Survey II

Date	a		b		c		d		e		f		g	
	Leader / CSR		Architectural design		Management		Construction technique 1		Solar energy		Project Manager / Survey on development needs		Survey on Social and Development issues	
	Masahiro KOBAYASHI		Keiichi KITAGAWA		Shin HIBINO		Hideo YAMADA		Daisuke FUJIWARA		Hiroyuki YOSHIZAWA		Yukiko OKADA	
	13 days		7 days		7 days		7 days		7 days		8 days		8 days	
1	1/8	Tue	Tokyo 10:00 (VN311)⇒Hanoi 14:30											
2	1/9	Wed	Courtesy call to JICA Vietnam Office											
3	1/10	Thu	MOET											
4	1/11	Fri	MOH											
5	1/12	Sat	Project development survey											
6	1/13	Sun	Data analysis		Tokyo 10:00 (VN311)⇒Hanoi 14:30						Tokyo 10:00 (VN311)⇒Hanoi 14:30			
7	1/14	Mon	Site survey: Hoa Binh General Hospital, Bach Mai Hospital								Site survey: Hoa Binh General Hospital, Bach Mai Hospital		Survey on concerned ministries and institutions, Site survey: Bach Mai Hospital	
8	1/15	Tue	Site survey: Improvement of Facilities of Primary Schools in Northern Mountain Region (phase2)		Site Survey: Improvement of Facilities of Primary Schools (phase 1)						Site Survey: Improvement of Facilities of Primary Schools (phase 1)		Site Survey: Improvement of Facilities of Primary Schools in Northern Mountain Region (phase2)	
9	1/16	Wed	Hanoi 11:20(VN1543) ⇒ Hue12:30 Site Survey: Hue Central Hospital								Hanoi 11:20(VN1543) ⇒ Hue12:30 Site Survey: Hue Central Hospital			
10	1/17	Thu	Site Survey:Improvement of Facilities of Primary Schools (phase 3) My Son Sanctuary		Site Survey:Improvement of Facilities of Primary Schools (phase 4)				Accompany (a)		Site Survey:Improvement of Facilities of Primary Schools (phase 3) & (phase 4) My Son Sanctuary			
11	1/18	Fri	Site survey: Cho Ray Hospital								MOET, MOIT		MOET, MOIT	
12	1/19	Sat	Meeting with CP		Ho Chi Minh 0:15 (VN300)⇒Narita 7:45						ditto		ditto	
13	1/20	Sun	Ho Chi Minh 5:50⇒Tokyo 13:20								Hanoi 0:10⇒Tokyo 7:00			

2. Members of the Survey

Name	Assignment	Institution	Field Survey I	Field Survey II
Mr. Masahiro KOBAYASHI	Leader / CSR	Gantan Beauty Industry Co., Ltd.	●	●
Mr. Manari HAYASHI	Overseas trade	Gantan Beauty Industry Co., Ltd.	●	
Mr. Masahiro TAMURA	Manufacture technology 1	Gantan Beauty Industry Co., Ltd.	●	
Mr. Kazumichi NISHIDA	Construction technique 2	Gantan Beauty Industry Co., Ltd.	●	
Mr. Yuichi INABA	Manufacture technology 2	Gantan Beauty Industry Co., Ltd.	●	
Mr. Shin HIBINO	Management	Gantan Beauty Industry Co., Ltd.		●
Mr. Daisuke FUJIWARA	Solar energy battery	Gantan Beauty Industry Co., Ltd.		●
Mr. Keiichi KITAMURA	Architectural design	Gantan Beauty Industry Co., Ltd.		●
Mr. Hideo YAMADA	Construction technique 1	Gantan Beauty Industry Co., Ltd.		●
Mr. Hiroyuki YOSHIZAWA	Project Manager/ Development needs	Mohri, Architect & Associates, Inc.	●	●
Ms. Yukiko OKADA	Survey on social/ developmental issues	Mohri, Architect & Associates, Inc.	●	●
Mr. Kazuna KOIZUMI	Survey on Facilities/ Infrastructure	Mohri, Architect & Associates, Inc.	●	